Fortrose Academy Mathematics Department

Established 1791

Breaking Brackets

Patterns & Sequences

Integers

Simultaneous Equations

Quadratic Equations

Standard Grade
Non-Calculator Material

Credit Level

%

Fractions

Decimals

Linear Equations

Formulae

Algebraic Fractions

Factorising

Indices

Quadratic Functions

Surds

SET 1 (CREDIT)

- Questions 1 to 10 should be done ***mentally***
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 45×800.	16. John sells football mugs for £2.59 each. How much does John make if he manages to sell 80 mugs?
2. Calculate 4.6×50	17. Calculate 14.5×0.2.
3. Calculate $9.9 + 6.6$	18. A car is travelling at 60 miles per hour. Calculate how long it will take to travel 135 miles.
4. Calculate $15.6 \div 6$.	19. Calculate $3^4 - 4^3$.
5. Calculate $1.26 \div 100$.	20. Calculate $500 \div 0.05$.
6. Calculate $\frac{1}{3}$ of 84.	21. A marathon runner completes 8 miles in 40 minutes. What is his speed in miles per hour?
7. Calculate $100 - 63.26$.	22. Evaluate the expression $p^2 - 2pq$ when $p = -4$ and $q = 3$.
8. Calculate $9 \times (-12)$.	23. Expand and simplify $(2c - 3)^2$.
9. Calculate 75% of £300.	24. Expand and simplify $(x - 3)(2x + 1)(x - 5)$.
10. Calculate $83 + 79$.	25. Factorise $6ab - 15bc$.
11. Calculate $2\frac{4}{5} + 3\frac{1}{3}$.	26. A function is defined by $f(x) = 20 - 3x^2$. Find $f(-3)$.
12. Calculate $1\frac{5}{6} \times \frac{9}{11}$.	27. Solve the equation $4(2x - 3) - 2(x + 5) = 8 - 4x$.
13. Calculate $\frac{3}{10}$ of $\left(\frac{1}{5} + \frac{1}{3}\right)$.	28. Express $\frac{x^2 + x - 12}{x^2 - 3x}$ in its simplest form.
14. Calculate $\frac{5}{9} \div \left(\frac{4}{3} - \frac{1}{2}\right)$.	29. Factorise $27a^5 - 12a^3$.
15. Calculate $28.3 - 5.75 \times 3$.	30. Solve the system of equations $3a + 5b = -2$, $2a - 3b = -14$

SET 2 (CREDIT)

- Questions 1 to 10 should be done ***mentally***
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 310×6000.	16. Given that $y = 6x - 13$, calculate y when $x = -4$.
2. Calculate 5.25×200	17. A woman drives 128 miles in 2 hours 40 minutes. Calculate her average speed in miles per hour.
3. Calculate $11.4 \div 7.8$	18. Simplify $\dfrac{3x^{-2} \times 5x^{4}}{x^{-1}}$
4. Calculate $7.75 \div 5$.	19. Solve the equation $\dfrac{x+2}{4} + \dfrac{x}{2} = 5$
5. Calculate $38.6 \div 1000$.	20. Simplify $2b^{1/2}(4b^{-1/2} - b^{1/2})$
6. Calculate $\dfrac{2}{5}$ of 80.	21. Expand and simplify $(2p - 3q)(3p + 2q)$
7. Calculate $-81 \div -9$.	22. A function is defined by $g(t) = x^{\frac{2}{3}}$. Evaluate $f(64)$.
8. Calculate $-5 \times (-35)$.	23. Express as a single fraction in its simplest form $\dfrac{5}{x-4} - \dfrac{3}{x+3}$.
9. Calculate 80% of £500.	24. Express $\sqrt{80} + \sqrt{5} - \sqrt{20}$ as a surd in its simplest form.
10. Calculate $-45 - 19$.	25. Factorise $2p^2 + 9p - 5$.
11. Calculate $\dfrac{5}{8} + 2\dfrac{3}{4}$.	26. Solve the equation $3x^2 - 7x - 6 = 0$.
12. Calculate $3\dfrac{2}{3} \times 5\dfrac{1}{4}$.	27. Solve the inequation $15 - 3(4 - 2x) \leq 8x + 7$.
13. Calculate $\left(\dfrac{1}{2} + \dfrac{1}{3} - \dfrac{1}{4}\right) \div 4\dfrac{2}{3}$.	28. Express $\dfrac{4c^2 - 9}{8c + 12}$ in its simplest form.
14. Calculate $\dfrac{7}{8} \div \left(\dfrac{1}{2} \text{ of } \dfrac{3}{8}\right)$.	29. Express $\dfrac{5}{\sqrt{7} - 2}$ as a fraction with a rational denominator.
15. Calculate $(30 \div 9.5) \times 4$.	30. Solve the system of equations $3c + 4d = -2$, $c - d = -3$

SET 3 (CREDIT)

- Questions 1 to 10 should be done ***mentally***
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 440×40.	16. Evaluate the expression $\frac{2x^2 - xy}{x + y}$ when $x = -3$ and $y = 4$.
2. Calculate 0.76×500.	17. A train travels at an average speed of 80 kilometres per hour. How far does it travel in 3 hours 45 minutes?
3. Calculate $23.5 + 4.52$.	18. Solve the equation $7(5 - 2x) - 3x = 4(1 - 6x) + 3$.
4. Calculate $28.32 \div 8$.	19. Factorise $15c^2 - 2c - 8$.
5. Calculate $8.4 \div 3000$.	20. A function is defined by $g(t) = \frac{4}{t^2}$. Calculate $g(\frac{1}{4})$.
6. Calculate $\frac{5}{6}$ of 96.	21. Express $\frac{2x - 3}{4} - \frac{x - 1}{3}$ as a single fraction in its simplest form.
7. Calculate $36 \div (-4)$.	22. Solve the equation $3x^2 - 4x - 15 = 0$.
8. Calculate $8 \times (-27)$.	23. Express $\frac{3x^2 - 10x + 8}{6x^2 - 5x - 4}$ in its simplest form.
9. Calculate 50% of £1286.	24. Simplify $\frac{6p^{-3} \times 2p^4}{4p^{-1}}$.
10. Calculate $18 \div (-36)$.	25. Solve the equation $5x - x^2 = 0$.
11. Calculate $4\frac{7}{10} - 2\frac{1}{5}$.	26. Make p the subject of the formula $q = \frac{3 - p}{4}$.
12. Calculate $8\frac{1}{2} \times \frac{1}{4}$.	27. Solve the system of equations: $4x - 3y = -5$, $2x + 5y = 4$
13. Calculate $\frac{5}{6} \times \left(\frac{1}{2} \div 2\frac{1}{2}\right)$.	28. Express $\sqrt{150} - \sqrt{24} + \sqrt{54}$ as a surd in its simplest form.
14. Calculate $\left(\frac{3}{4} \div \frac{1}{7}\right) \times \frac{4}{5}$.	29. Solve the equation $\frac{4}{x - 2} - \frac{3}{x + 4} = 0$.
15. Calculate $(9 \times 3.6) \div (1.9 \div 2.1)$.	30. A function is defined by $h(t) = 9^t$. Calculate $h(\frac{3}{2})$.

SET 4 (CREDIT)

- Questions 1 to 10 should be done ***mentally***
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 270×60.	16. What fraction of a minute (in its simplest form) is 48 seconds?
2. Calculate 0.34×300.	17. In a survey, 240 out of 600 people had satellite television. Calculate the angle represented by this in a pie chart?
3. Calculate $7.25 \div 9.5$.	18. Solve the equation $x^2 - x - 20 = 0$.
4. Calculate $23.2 \div 4$.	19. Express $\frac{x+2}{3} - \frac{2x-1}{5}$ as a single fraction in its simplest form.
5. Calculate $\frac{3}{4}$ of 160.	20. Express $\frac{10}{\sqrt{5}-\sqrt{3}}$ as a fraction with a rational denominator.
6. Calculate $31.4 \div 1000$.	21. Solve the equation $3(4x-7)-(4+3x) = 40 - 4x$
7. Calculate $-42 \div -7$.	22. A function is defined by $g(x) = 8\sqrt{x}$. Calculate $g(48)$, expressing your answer in its simplest form.
8. Calculate 4×-8.	23. Simplify $3s^{-2}(2s^{1/2} - s^{-1})$.
9. Calculate 70% of £500.	24. Make a the subject of the formula $R = Q^2(a - 2b)$.
10. Calculate $24 + (-19)$.	25. Solve the system of equations $5p + 7q = 17$, $2p + 2q = 2$
11. Calculate $3\frac{1}{16} - 2\frac{7}{12}$.	26. Express $\frac{2x^2-18}{5x+15}$ as a fraction in its simplest form.
12. Calculate $1\frac{1}{2} \times 6\frac{1}{3}$.	27. Solve the inequation $7 - 2(4-x) \geq 5(2x-3) - 10$.
13. Calculate $\frac{2}{3} \div \frac{5}{12}$.	28. Simplify $\frac{2x^2+7x+6}{x^3-4x}$.
14. Calculate $\left(\frac{3}{5} \div \frac{1}{5} \div \frac{2}{10}\right) \times \frac{3}{4}$.	29. Expand and simplify $(x-4)(2x-1)^2$.
15. Calculate $20 \div 5 \div 4.4 \times 3$.	30. Simplify $\frac{5p^{-3} \times 4p^2}{2p^{-5}}$.

SET 5 (CREDIT)

- Questions 1 to 10 should be done *mentally*
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 45×500.	16. Evaluate the expression $x^3y - 4y$ when $x = -2$ and $y = -4$.
2. Calculate 0.02×6000.	17. After a 20% increase, a football season ticket costs £312. How much did it cost before?
3. Calculate $11.78 + 5.3$.	18. Solve the equation $\frac{3x-2}{4} - \frac{x+1}{6} = \frac{5}{3}$.
4. Calculate $49.44 \div 6$.	19. Factorise fully $p^3q^2 - 16pq^2$.
5. Calculate $1.4 \div 2000$.	20. Express as a single fraction in its simplest form $\frac{2}{2x-1} - \frac{5}{x}$.
6. Calculate 0.4×0.5.	21. Simplify $\frac{3x^4 - 27}{4x^2 + 12}$.
7. Calculate $\frac{2}{5}$ of 180.	22. Solve the system of equations $7y + 5x = 18$ $3y - 4x = 20$
8. Calculate -74×5.	23. A function is defined by $f(x) = \frac{6}{\sqrt{x}}$. Calculate $f(3)$, expressing your answer as a fraction with a rational denominator.
9. Calculate 15% of £250.	24. Expand and simplify $(x-3)(x+4)(x-1)$.
10. Calculate $(-83) + 42$.	25. Factorise fully $3x^3 - 8x^2 - 3x$.
11. Calculate $5\frac{1}{3} - 2\frac{5}{6}$.	26. Solve the equation $2x^2 + 7x = 4$.
12. Calculate $1\frac{3}{4} \div 1\frac{2}{5}$.	27. Make x the subject of the formula $y = \sqrt{\frac{x-3}{2}}$.
13. Calculate $\left(\frac{1}{2} \div \frac{1}{3}\right) \times 4 \div \frac{1}{4}$.	28. Simplify $\frac{2c^{-3} \times c^2}{c^{-3}}$.
14. Calculate $2 - \frac{1}{2}\left(2\frac{1}{2} \div 5\right)$.	29. Simplify $x^{2/3}\left(x^{1/3} + x^{-2/3}\right)$.
15. Calculate $6.8 \div 4 \times 5 - 3.2$.	30. Solve the equation $20 - 2(3x + 8) = 8 - 5x$.

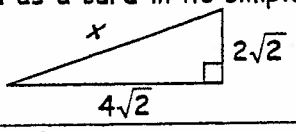
SET 6 (CREDIT)

- Questions 1 to 10 should be done *mentally*
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 800×560.	16. Express 0.64 as a fraction in its simplest form.
2. Calculate 0.6×5000.	17. An Olympic athlete ran the 800 metres in 1 min 48 secs. How long would it take him to run the 1500 metres, assuming he keeps the same average speed ?
3. Calculate $15.2 + 3.85$.	18. In 1998, the cost of a full page ad (black & white) in the Sunday Times was £48 500. How much would it cost to place 6 full page ads ? Give your answer in scientific notation.
4. Calculate $36.25 \div 5$.	19. Solve the system of equations $3p + 4q - 6 = 0$, $p - 2q + 8 = 0$.
5. Calculate $\frac{1}{4}$ of 0.96.	20. Simplify $\frac{16a^2 - 25}{8a^2 + 2a - 15}$.
6. Calculate $28.34 \div 2000$.	21. Evaluate the expression $p^2q - pq^2$ when $p = -3$ and $q = -4$.
7. Calculate $(-96) \div (-8)$.	22. Simplify $\frac{ab^3 \times ab^{-2}}{2b^2}$.
8. Calculate $(-44) \times (-4)$.	23. Express as a single fraction in its simplest form $\frac{3x}{2} - \frac{5x - 3}{3}$.
9. Calculate 30% of £3030.	24. Solve the equation $x(3x - 13) = 10$.
10. Calculate $59 - (-42)$.	25. A function is defined by $g(t) = 81^t$. Evaluate $g\left(\frac{3}{4}\right)$.
11. Calculate $3\frac{3}{5} + 2\frac{1}{4}$.	26. Make r the subject of the formula $V = \frac{4}{3}\pi r^3$
12. Calculate $3\frac{3}{5} \times \frac{2}{3}$.	27. Express $\sqrt{32} - \sqrt{18} + \sqrt{8}$ as a surd in its simplest form.
13. Calculate $\left(\left(\frac{2}{3} \times \frac{1}{2}\right) \div \frac{3}{4}\right) \times 3$.	28. Solve the equation $\frac{x + 1}{3} - \frac{2x - 5}{5} = 1$.
14. Calculate $\left(\frac{1}{5} \times 1\frac{1}{4}\right) - \left(\frac{2}{3} \div 4\right)$.	29. Express $\frac{10}{5 + \sqrt{2}}$ as a fraction with a rational denominator.
15. Calculate $7.9 \times 30 - 12.8 \div 4$.	30. Solve the inequality $2 - (6 - 4x) \leq 15 - 9(2x + 7)$

SET 7 (CREDIT)

- Questions 1 to 10 should be done ***mentally***
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 350×70.	16. Two cubes have edge length 3 cm and 5 cm respectively. Show that the ratio of their volumes is 0.216.
2. Calculate 0.315×2000.	17. Calculate x as a surd in its simplest form. 
3. Calculate $3.94 + 8.7$.	18. Simplify $\dfrac{2y^2 - 50}{y^2 + 6y + 5}$.
4. Calculate $17.04 \div 3$.	19. Expand and simplify $(p - 2q)^2 - q(p + q)$.
5. Calculate $\frac{3}{5}$ of 75.	20. Solve the system of equations $4x + 2y = 11$ $x - y = -1$
6. Calculate $1.76 \div 200$.	21. Simplify $\dfrac{4x^5 \times 7x^{-3}}{2x^{-2}}$.
7. Calculate $84 \div (-7)$.	22. Express $\dfrac{3x + 5}{4} + \dfrac{2x - 1}{3}$ as fraction in its simplest form.
8. Calculate $(-17) \times (-9)$.	23. Solve the equation $2(1 - 5p) - 12 = 10 - 6p$.
9. Calculate 90% of 0.9.	24. A function is defined by $f(p) = \frac{1}{2}p^{-2}$. Calculate $f\left(\frac{1}{4}\right)$.
10. Calculate $-27 + (-38)$.	25. The area of a washer is given by the formula $A = \pi(R - r)(R + r)$. Make r the subject of the formula.
11. Calculate $5\frac{2}{3} + \frac{5}{6}$.	26. Solve the equation $6 = x(4x + 5)$.
12. Calculate $2\frac{1}{8} \times 4\frac{1}{2}$.	27. Express $\sqrt{160} - \sqrt{10} + \sqrt{90}$ as a surd in its simplest form.
13. Calculate $\left(\frac{2}{3} + \frac{1}{2} \div 2\right) \times \frac{3}{5}$.	28. Simplify $u^{3/2}(u^{1/2} - u^{-1/2})$.
14. Calculate $\left(2\frac{1}{2} - 1\frac{1}{4}\right) \div 2\frac{1}{2}$.	29. In 1997, the RSPCA investigated 153,664 complaints of cruelty to animals. Write this figure in standard form, correct to four significant figures.
15. Calculate $(9.7 - 4) \times (1.5 \times 4)$.	30. Solve for x $p - 2 = \dfrac{3 - x}{3 + x}$.

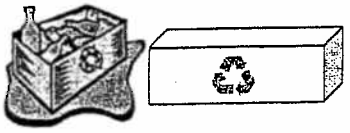
SET 8 (CREDIT)

- Questions 1 to 10 should be done ***mentally***
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 2200×600.	16. Calculate $0.048 \div 0.006$.
2. Calculate 0.063×9000.	17. A cuboidal container has volume $1.5\ m^3$. Calculate its height, given that the base has dimensions 50 cm by 60 cm.
3. Calculate $7.95 - 3.88$.	18. A plane is flying at 600 miles per hour. How long will it take to fly 250 miles?
4. Calculate $27.28 \div 8$.	19. Solve the equation $4x^2 = 6x$.
5. Calculate $\frac{3}{4}$ of 140.	20. Express $\frac{p^4 - 9p^2}{p - 3}$ as a fraction in its simplest form.
6. Calculate $2.79 \div 300$.	21. Factorise $6x^2 + x - 15$.
7. Calculate $36 \div (-6)$.	22. Solve the system of equations $\frac{2}{3}p - \frac{1}{2}q = 5$ $\frac{1}{2}p + \frac{1}{3}q = 8$
8. Calculate $(-37) \times 6$.	23. Express $\sqrt{32} + \sqrt{72} - \sqrt{50}$ as a surd in its simplest form.
9. Calculate 60% of 2500.	24. Express $\frac{8}{1 - \sqrt{5}}$ as a fraction with a rational denominator.
10. Calculate $-28 - (-14)$.	25. A function is defined by $f(t) = 2(t - 2)(t + 2)$. Show that $f(\sqrt{6}) = k$, where k is an integer.
11. Calculate $8\frac{4}{5} - 6\frac{1}{4}$.	26. Express $\frac{3x + 5}{3} - \frac{x - 3}{5}$ as a single fraction.
12. Calculate $\frac{5}{8} \div 1\frac{1}{4}$.	27. Solve the inequality $5(2 - x) - 3(2 - 3x) \geq 2 + 3x$.
13. Calculate $\left(2\frac{2}{3} \times \frac{3}{8}\right) - \left(1 - \frac{1}{2} - \frac{1}{4}\right)$.	28. Make h the subject of the formula $v = \sqrt{2gh}$.
14. Calculate $\left(2\frac{1}{5} \times \frac{1}{11}\right) \div 5$.	29. Simplify $\frac{2x^{-1/2} \times x^{3/2}}{x^{1/2}}$.
15. Calculate $(50 - 0.5) \times (2.4 \div 6)$.	30. Simplify $(b^{1/2} - 1)^2$.

SET 9 (CREDIT)

- Questions 1 to 10 should be done ***mentally***
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 560×800.	16. One stage of a cycle race is 88 km. Markers are placed along the route at intervals of 1.6 km. How many markers are there?
2. Calculate 10.5×400.	17. A recycling bin measures 2.5 m by 0.6 m by 0.8 m. What is its capacity in litres? 
3. Calculate $2.74 + 1.98$.	18. Simplify $\dfrac{2x^2 - 3x - 20}{3x^2 - 11x - 4}$.
4. Calculate $16.68 \div 6$.	19. A function is given by $p(x) = 3x^{2/3}$. Evaluate $p(8)$.
5. Calculate $\frac{3}{4}$ of 180.	20. Solve the system of equations $4p - q + 13 = 0$ $3p + 2q + 7 = 0$
6. Calculate $20.4 \div 40$.	21. Express $\dfrac{3}{x-4} + \dfrac{2}{x+5}$ as a single fraction.
7. Calculate $18 \times (-9)$.	22. Expand and simplify $(2a - b)(a + 2b) - a(2a - 3b)$
8. Calculate $(-56) \times -2$.	23. Solve the equation $18 - 7(2 - x) = 13 - 4x$
9. Calculate 5% of £3.80.	24. Simplify $\dfrac{6p^4 \times 2p^{-1}}{3p^2}$.
10. Calculate $-61 - (-87)$.	25. Make s the subject of the formula $R = \sqrt{\dfrac{s}{t}} - 2$.
11. Calculate $7\frac{5}{6} + 3\frac{1}{3}$.	26. Express $\dfrac{7}{\sqrt{3}}$ as a fraction with a rational denominator.
12. Calculate $2\frac{2}{3} \times \frac{9}{16}$.	27. Express $\sqrt{48} + \sqrt{12} - \sqrt{27}$ as a surd in its simplest form.
13. Calculate $3\frac{2}{5} \div 1\frac{3}{5}$.	28. Simplify $(a^{1/2} + a^{-1/2})(a^{1/2} - a^{-1/2})$.
14. Calculate $12 \div \left(\frac{3}{4} \times \frac{8}{9}\right)$.	29. Solve the equation $\dfrac{2x-3}{2} - \dfrac{x-1}{6} = 1$.
15. Calculate $60 \times 0.3 \div 0.2$.	30. Factorise fully $ab^3 - a^3b$

SET 10 (CREDIT)

- Questions 1 to 10 should be done ***mentally***
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 9000×42.	16. Water is pumped into a tank at the rate of 150 litres per minute. How long will it take to fill a tank containing 480 litres?
2. Calculate 0.056×500.	17. A cylindrical container has volume of 1 litre. The height (cm) is twice the radius. Find the *exact* radius of the container.
3. Calculate $1.89 \div 9.12$.	18. Solve the equation $x + 1 = \frac{6}{x}$.
4. Calculate $25.68 \div 3$.	19. Simplify $\frac{5x^2 - 20}{x^2 + 2x}$.
5. Calculate $\frac{5}{6}$ of 138.	20. Express $\sqrt{20} - \sqrt{45} + \sqrt{80}$.
6. Calculate $1.05 \div 300$.	21. Express $\frac{5}{x} - \frac{3}{x-2}$ as a single fraction.
7. Calculate $65 \times (-5)$.	22. Factorise $8x^2 - 6x - 5$.
8. Calculate $(-7) \times 27$.	23. Express $\frac{1}{\sqrt{5} - \sqrt{2}}$ as a fraction with a rational denominator.
9. Calculate 40% of £2.60.	24. A function is given by $f(x) = \tan x^\circ$. Evaluate $f(30)$, expressing your answer as a single fraction with a rational denominator.
10. Calculate $74 - (-19)$.	25. Solve the system of equations $x - 3y = -11$, $2y - 3x = 12$.
11. Calculate $8\frac{2}{3} \div 4\frac{1}{2}$.	26. Make u the subject of the formula $v^2 = u^2 + 2as$.
12. Calculate $3\frac{1}{4} \times 1\frac{1}{3}$.	27. Simplify $\frac{3u^{-4} \times 5u^3}{u^{-2}}$.
13. Calculate $\left(3\frac{1}{2} \div \frac{3}{4}\right) \times \frac{1}{3}$.	28. Solve the equation $\frac{4x+3}{5} + \frac{2x+3}{3} = 6$.
14. Calculate $\left(\left(1\frac{3}{4} \div 2\frac{1}{3}\right) - \frac{1}{2}\right) \times 2$.	29. Expand and simplify $(2x-3)(x+2)(x-1)$.
15. Calculate $(4.4 \times 20) \div \left(1 \div \frac{1}{11}\right)$.	30. Solve the equation $15 - (3 - 6x) = 9x + 10$.

SET 11 (CREDIT)

- Questions 1 to 10 should be done *mentally*
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 350×700.	16. An object moves with speed 0.1 m/s. What is its speed in km/h?
2. Calculate 2.06×5000.	17. Simplify $\dfrac{x^2 + x - 6}{2x^2 - x - 6}$.
3. Calculate $9.2 + 8.81$.	18. Express $\sqrt{150} - \sqrt{24}$ as a single surd in its simplest form.
4. Calculate $41.70 \div 5$.	19. Solve the equation $x^2 + 3x = 0$.
5. Calculate $\frac{3}{8}$ of 8.8.	20. A function is given by $f(x) = 3(x-2)^2 + 5$. Write down the co-ordinates of the turning point and state its nature.
6. Calculate $0.26 \div 20$.	21. Express $\dfrac{2}{5 - \sqrt{2}}$ as a fraction with a rational denominator.
7. Calculate $(-36) \times (-6)$.	22. Express $\dfrac{3x-4}{2} - \dfrac{x+1}{6}$ as a single fraction.
8. Calculate $72 \div (-8)$.	23. Make a the subject of the formula $s = ut + \frac{1}{2}at^2$.
9. Calculate 30% of £25.	24. Expand and simplify $(p + 2q)^3$.
10. Calculate $-36 + (-22)$.	25. Solve the equation $\dfrac{3x}{2} - \dfrac{x+2}{4} = 4$.
11. Calculate $\frac{3}{8} \div 2\frac{1}{5}$.	26. Solve the system of equations $5p - 8q = 14$, $p - 4q = 10$.
12. Calculate $2\frac{5}{6} \times \frac{3}{7}$.	27. Simplify $\dfrac{4q^{-3} \times 2q^{-1}}{2q^2 \times q}$.
13. Calculate $\left(\left(\frac{3}{4} \times 2\frac{2}{3}\right) - \frac{1}{2}\right) \div \frac{1}{2}$.	28. Solve the inequation $5(2x-3) - (8x-2) \le 7x - 8$.
14. Calculate $\left(4 - \frac{1}{3}\right) \times \frac{3}{4}$.	29. Find the co-ordinates of the points where the graph of the function $y = 2x^2 + x - 6$ crosses the x-axis.
15. Calculate $2.34 \times 50 \div (2.8 + 0.2)$.	30. Find the co-ordinates of the turning point of the function $f(x) = (x+4)(x-2)$.

SET 12 (CREDIT)

- Questions 1 to 10 should be done *mentally*
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 80×6200.	16. A triangle's base is 5 cm more than its height. If the area of the triangle is $18\ \text{cm}^2$, find its base and height.
2. Calculate 0.15×300.	17. Calculate $0.16 \div 0.02$.
3. Calculate $10.03 - 6.88$.	18. Evaluate the expression $\frac{a-2b}{2a+b}$ when $a = -5$ and $b = 2$, expressing your answer as a mixed number.
4. Calculate $36.2 \div 5$.	19. Express $\frac{7}{3-\sqrt{3}}$ as a fraction with a rational denominator.
5. Calculate $\frac{2}{3}$ of 0.18.	20. Simplify $\frac{25a^2-64}{10a+16}$.
6. Calculate $10.8 \div 2000$.	21. Solve the system of equations $4y - 2x = 7$, $y + 3x = -3\frac{1}{2}$.
7. Calculate $78 \times (-4)$.	22. Solve the equation $\frac{1}{x}(4-x) = 3$.
8. Calculate $96 \div (-12)$.	23. Expand and simplify $(x-y)(x+y)^2 - x^2(x+y)$
9. Calculate 60% of £2.40.	24. A parabola has equation $y = -2(x+3)^2 - 4$. Write down the co-ordinates of the turning point.
10. Calculate $73 - (-21)$.	25. Solve the inequation $8 - 3(2x+5) \geq 1 - 4x$.
11. Calculate $\frac{4}{7} + 2\frac{1}{3}$.	26. Simplify $\frac{9u^{-2} \times 6u^{-1}}{3u^{-4}}$.
12. Calculate $3\frac{1}{4} \div 1\frac{3}{4}$.	27. Make u the subject of the formula $v = \frac{u-a}{u+a}$.
13. Calculate $\left(\frac{1}{4} \div \left(\frac{1}{2} + \frac{1}{3}\right)\right) \times 6\frac{2}{3}$.	28. Express $\frac{3}{4x-3} - \frac{2}{2-x}$ as a single fraction in its simplest form.
14. Calculate $\left(3\frac{1}{2} - 1\frac{1}{4}\right) \div \frac{3}{4} \times \frac{1}{3}$.	29. Solve the equation $\frac{x+5}{3} - \frac{3x-2}{4} = 3$.
15. Calculate $(0.75 \times 500) \div 0.375$.	30. Express $\sqrt{28} - \sqrt{7} + \sqrt{63}$ as a surd in its simplest form.

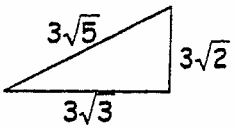
SET 13 (CREDIT)

- Questions 1 to 10 should be done ***mentally***
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 8600×50.	16. A plane flies 650 miles in 2 hours 12 minutes. What is its speed in miles per hour?
2. Calculate 0.47×800.	17. Orange squash is sold in 1.75 litre bottles. How many bottles could be filled from a 140 litre container?
3. Calculate $3.24 + 9.6$.	18. Simplify $\dfrac{x^2 - 3x - 10}{x^2 - 4}$.
4. Calculate $20.52 \div 6$.	19. Express $\sqrt{128} - \sqrt{50} - \sqrt{8}$ as a single surd in its simplest form.
5. Calculate $\dfrac{2}{3}$ of 54.	20. Express $\dfrac{1}{2 - 3x} - \dfrac{3}{x + 2}$ as a single fraction in its simplest form.
6. Calculate $1.28 \div 40$.	21. A function is defined by $f(x) = \dfrac{1}{\sqrt{x} - 2}$. Calculate $f(6)$, expressing your answer as a fraction with a rational denominator.
7. Calculate $56 \times (-7)$.	22. Solve the system of equations $6r + 5s = 13$, $2r - s = 7$.
8. Calculate $(-44) \times 6$.	23. Expand and simplify $p^{-3}\left(2p^2 - \dfrac{1}{p}\right)$.
9. Calculate 40% of £300.	24. Expand and simplify $x(2x - 1)^2 - x^2(2x + 1)$.
10. Calculate $31 - (-72)$.	25. Solve the equation $8(3 - x) - 5(4 - 3x) = 4x - 2$.
11. Calculate $\dfrac{5}{8} + \dfrac{5}{6}$.	26. A parabola has equation $y = x^2 - 2x - 8$. Find the co-ordinates of the turning point and state its nature.
12. Calculate $\dfrac{2}{3} \times 4\dfrac{1}{5}$.	27. Make b the subject of the formula $Q = ab^2 + t$.
13. Calculate $\left(\dfrac{1}{2} \times \left(\dfrac{1}{4} - \dfrac{1}{5}\right)\right) \div \dfrac{1}{20}$.	28. Solve the equation $6x^2 + 7x - 3 = 0$.
14. Calculate $\left(\left(2\dfrac{1}{3} \div 1\dfrac{1}{3}\right) - \dfrac{3}{4}\right) \times \dfrac{1}{5}$.	29. Solve the equation $\dfrac{2 - x}{4} + \dfrac{x + 4}{2} = 4$.
15. Calculate $32.8 \div 8 \div 4.65$.	30. Solve the equation $(x - 2)(x + 3) = 6$.

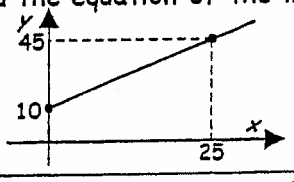
SET 14 (CREDIT)

- Questions 1 to 10 should be done ***mentally***
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 2200×700.	16. Prove that the triangle below is right-angled 
2. Calculate 0.8×3000.	17. A car is travelling at 90 kph. How far will it travel in 0.18 seconds.
3. Calculate $4.79 \div 6.4$.	18. Simplify $\dfrac{6x^2 + 13x + 5}{2x^2 + 5x + 2}$.
4. Calculate $72.96 \div 8$.	19. Solve the equation $\dfrac{x+4}{x} = 3x$.
5. Calculate $\dfrac{2}{5}$ of 140.	20. Expand and simplify $(2x-5)(x+3) - (x+1)(3x-2)$.
6. Calculate $25.5 \div 500$.	21. Simplify $\dfrac{4x+2}{3} - \dfrac{x-2}{4}$.
7. Calculate $(-82) \times (-3)$.	22. Solve the inequation $7(2-x) - 3(4-x) \geq 5 - 5x$.
8. Calculate $(-45) \div (-5)$.	23. Solve the equation $\dfrac{3x-5}{2} - \dfrac{x+4}{3} = 2$.
9. Calculate 25% of £1.60.	24. Express $\dfrac{8}{\sqrt{6}}$ as a fraction with a rational denominator.
10. Calculate $63 \div (-38)$.	25. Express $\sqrt{54} + \sqrt{24} - \sqrt{6}$ as a single surd in its simplest form.
11. Calculate $1\dfrac{3}{5} - \dfrac{1}{8}$.	26. Expand and simplify $\dfrac{1}{x}(2x^{1/2} + x)$.
12. Calculate $3\dfrac{3}{4} \times 1\dfrac{3}{5}$.	27. Make s the subject of the formula $z = \dfrac{s-4}{3}$.
13. Calculate $\left(4\dfrac{1}{5} \div \dfrac{7}{15}\right) \div \dfrac{3}{4}$.	28. Solve the equation $4x^2 - 8x + 3 = 0$.
14. Calculate $\left(5 - 1\dfrac{3}{4}\right) \div 3\dfrac{1}{4}$.	29. Solve the system $2y - 3x = 26$, $y + x = -2$.
15. Calculate $60 \div 0.1 \times 0.05$.	30. Factorise fully $9c^3 - 81c$.

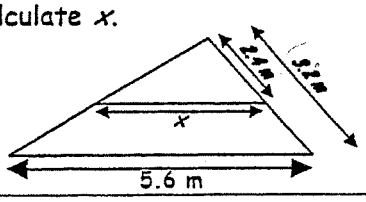
SET 15 (CREDIT)

- Questions 1 to 10 should be done ***mentally***
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 730×60.	16. Find the equation of the line below 
2. Calculate 0.16×600.	17. A flask has volume 250 ml. It contains 40.5 ml of a chemical. What percentage of the flask is unfilled?
3. Calculate $8.92 + 3.4$.	18. Simplify $\dfrac{4a^3 + 16a}{a - 2}$.
4. Calculate $15.18 \div 6$.	19. Solve the equation $2x = 15 - x^2$.
5. Calculate $\dfrac{5}{8}$ of 120.	20. T varies directly as Q and inversely as the square of R. Calculate the effect on T if Q is multiplied by $\dfrac{3}{2}$ and R by $\dfrac{1}{3}$.
6. Calculate $20.05 \div 5000$.	21. Solve the system of equations $3p - q = 7$, $p + 2q = 0$
7. Calculate $(-72) \div (-3)$.	22. Make g the subject of the formula $R = t - \sqrt{\dfrac{1}{g}}$.
8. Calculate $16 \times (-9)$.	23. Simplify $\dfrac{6x^{-4} \times 8x^{-1}}{2x^3}$.
9. Calculate 40% of £24.	24. Express $\dfrac{3}{\sqrt{2}}$ as a fraction with a rational denominator.
10. Calculate $(-22) - (-22)$.	25. Express $\sqrt{252} - \sqrt{112} - \sqrt{28}$ as a single surd in its simplest form.
11. Calculate $5\dfrac{3}{8} - 4\dfrac{1}{4}$.	26. Expand and simplify $(x - 3)(x^2 - 6x + 7)$.
12. Calculate $\dfrac{6}{7} \times 1\dfrac{5}{9}$.	27. Solve the equation $4(2x + 1) - 5(3x + 2) = 2 - 3x$.
13. Calculate $\left(\dfrac{3}{4} \div \left(\dfrac{1}{2} \times \dfrac{1}{2}\right) \div \dfrac{1}{3}\right)$.	28. Express $\dfrac{8}{\sqrt{7} - \sqrt{3}}$ as a fraction with a rational denominator.
14. Calculate $\left(1\dfrac{2}{3} + \dfrac{1}{2}\right) \div 2\dfrac{1}{6}$.	29. Factorise $12x^2 + 5x - 2$.
15. Calculate $(54 - 1.6 \times 30) \div 0.5$.	30. A function is defined by $g(t) = 2^t$. Find t given that $g(t) = \dfrac{1}{16}$.

SET 16 (CREDIT)

- Questions 1 to 10 should be done ***mentally***
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 250×700.	16. Calculate x. 
2. Calculate 1.34×1000.	17. A sphere and a cylinder have equal volume. The radius of the sphere is $\frac{2}{3}$ that of the cylinder. Find the height of the cylinder.
3. Calculate $18.2 \div 3.88$.	18. Express $\sqrt{18} - \sqrt{8}$ as a single surd in its simplest form.
4. Calculate $13.96 \div 4$.	19. Solve the equation $\frac{3}{x-1} + 2 = \frac{6}{x-2}$.
5. Calculate $\frac{1}{7}$ of 287.	20. Express $\frac{2x-7}{3} - \frac{x-2}{4}$ as a single fraction in its simplest form.
6. Calculate $12.4 \div 400$.	21. Expand and simplify $(x^2-2)(x^2+2) - x^3(x+1)$.
7. Calculate $64 \div (-32)$.	22. Express $\frac{10}{5-\sqrt{7}}$ as a fraction with a rational denominator.
8. Calculate $(-9) \times (-13)$.	23. Solve the equation $5x - 3(4-x) = 8 - 2x$.
9. Calculate 70% of £18.	24. Simplify $p^{3/4}(p^{-1/2} - p^{1/4})$.
10. Calculate $(-22) + (-17)$.	25. Simplify $\frac{6x^{-2} \times 4x^{1/2}}{3x}$.
11. Calculate $5\frac{5}{6} + 4\frac{2}{3}$.	26. Simplify $\frac{x^4-1}{x^3+x}$.
12. Calculate $2\frac{3}{4} \times \frac{3}{11}$.	27. A function is defined by $g(x) = \frac{2}{3}x^{-1}$. Calculate $g(\sqrt{8})$, expressing your answer as a fraction with a rational denominator.
13. Calculate $\left(1\frac{1}{3} \div \frac{1}{2} \div 1\right) \times \frac{3}{11}$.	28. Given that $f(x) = \frac{1}{1-\frac{1}{x}}$, find $f\left(\frac{1}{x}\right)$.
14. Calculate $\left(5\frac{1}{2} \times \frac{1}{3} - \frac{1}{3}\right) \div \frac{9}{8}$.	29. Make R the subject of the formula $t = \frac{3}{R} - 4$.
15. Calculate $60 \times 1.2 \div (8 \times 1.5)$.	30. Factorise $p^4q^4 - 4p^2q^2 + 3$.

SET 17 (CREDIT)

- Questions 1 to 10 should be done *mentally*
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 48×400.	16. In a 100 metre race, the winner clocked 9.9 secs with the athlete in last place timed at 10.2 secs. Find the ratio of the time of the last placed sprinter to the winner, expressing your answer in the form $m : 1$.
2. Calculate 1.03×600.	17. Evaluate $-2^3 - \left(4 + (-2)^2\right)^2$.
3. Calculate $8.2 - 3.76$.	18. Make x the subject of the formula $S = \frac{x^3}{l} - 4$.
4. Calculate $29.61 \div 7$.	19. Express $\frac{4}{\sqrt{2}}$ as a fraction with a rational denominator.
5. Calculate $\frac{1}{4}$ of 110.	20. Show that $\sqrt{3 - 2\sqrt{2}} = \sqrt{2} - 1$.
6. Calculate $24.6 \div 40$.	21. Simplify $\frac{x^2 - 2x - 3}{2x + 2}$.
7. Calculate $121 \div (-11)$.	22. Express $\frac{2}{3 - x} - \frac{5}{2x - 3}$ as a single fraction in its simplest form.
8. Calculate $44 \times (-5)$.	23. Simplify $\frac{4z^2 \times 3z^{-1}}{2z^2}$.
9. Calculate 20% of £3.80.	24. A function is defined by $f(x) = (\sin x^\circ - 1)^2$. Show that $f(60) = \frac{7 - 4\sqrt{3}}{4}$.
10. Calculate $(-26) \div (-72)$.	25. Solve the equation $\frac{x}{3} = \frac{2x - 1}{5}$.
11. Calculate $2\frac{3}{5} - 1\frac{1}{7}$.	26. Simplify $b^{-1/2}\left(\frac{2}{b} - b\right)$.
12. Calculate $2\frac{1}{2} \div \frac{5}{6}$.	27. Expand and simplify $p^2(p - q)^2 - (p^2 + q^2)^2$.
13. Calculate $\frac{5}{8} \times 4\frac{4}{5}$.	28. Solve the inequality $5y \le 14 - 2(3y - 2)$.
14. Calculate $\frac{2}{3}$ of $\left(\frac{3}{4} \div \frac{1}{2}\right)$.	29. Express $\sqrt{20} - \sqrt{5}$ as a single surd in its simplest form.
15. Calculate $30 \times 6.8 \div 4 - 50$.	30. Solve the system of equations $2y = 3x + 5$, $y - x = 3$

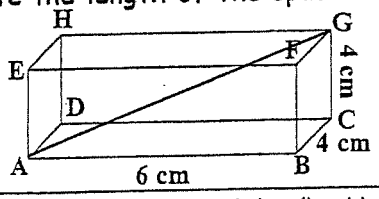
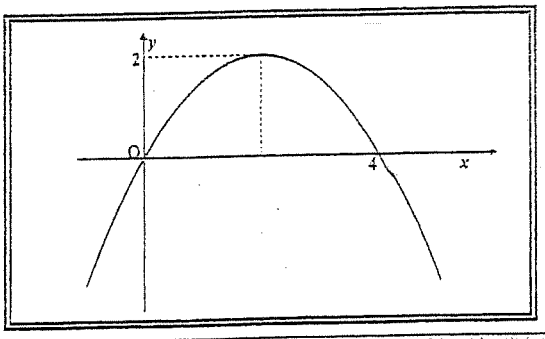
SET 18 (CREDIT)

- Questions 1 to 10 should be done ***mentally***
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 660×200.	16. 9 pupils in a class of 25 are struck down by flu. What percentage is this?
2. Calculate 30.5×4000.	17. Solve the equation $2\cos x^\circ + \sqrt{3} = 0$ for $0 \le x \le 360$
3. Calculate $9.13 - 6.6$.	18. Simplify $\dfrac{2x^2 + 3x}{2x^2 + x - 6}$.
4. Calculate $26.28 \div 3$.	19. Solve the equation $(x-1)(x+2) = 3x + 1$.
5. Calculate $\frac{3}{7}$ of 91.	20. Express $\dfrac{15}{\sqrt{3} - 1}$ as a fraction with a rational denominator.
6. Calculate $8.04 \div 300$.	21. Express $\dfrac{3}{x} - \dfrac{5}{x^2}$ as a single fraction in its simplest form.
7. Calculate $24 \div (-2)$.	22. Simplify $\dfrac{z^{-3} \times 4z^2}{2z^{-1}}$.
8. Calculate $-78 \times (-3)$.	23. Expand and simplify $(2p-3)(p+4)(p-1)$.
9. Calculate 15% of £15.	24. Solve the equation $6x = 20 - 2(6 - x)$.
10. Calculate $48 + (-40)$.	25. Solve the equation $\dfrac{7}{x} = \dfrac{3x - 1}{10}$.
11. Calculate $6\frac{1}{7} - 4\frac{3}{5}$.	26. Simplify $s^{-2}\left(s + \dfrac{2}{s}\right)$, expressing your answer in index form.
12. Calculate $\frac{7}{8} \div 1\frac{1}{2}$.	27. Express $\sqrt{500} + \sqrt{45} - \sqrt{5}$ as a single surd in its simplest form.
13. Calculate $1\frac{2}{3} \times \frac{7}{10}$.	28. Solve the system of equations $3y - 2x = 11$, $2y + x = 12$.
14. Calculate $\dfrac{2}{5} \times \left(\dfrac{1}{3} \div \dfrac{1}{4}\right) \div \dfrac{3}{10}$.	29. Make h the subject of the formula $B = \dfrac{2 - h^2}{v}$
15. Calculate $80 \times 0.4 - 0.3 \times 15$.	30. A function is defined by $g(x) = 3x - x^2$. Find the maximum value of g.

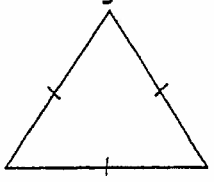
SET 19 (CREDIT)

- Questions 1 to 10 should be done *mentally*
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 7000×82.	16. Calculate the length of the space diagonal AG. 
2. Calculate 0.05×400.	17. A train is travelling at 80 km/h. How long will it take to travel 190 km?
3. Calculate $2.7 + 8.66$.	18. Simplify $\dfrac{x^2 + 4x + 3}{x^2 - 9}$.
4. Calculate $37.6 \div 5$.	19. Make c the subject of the formula $E = mc^2$.
5. Calculate $\dfrac{5}{8}$ of 280.	20. Solve the equation $6x^2 - x - 1 = 0$.
6. Calculate $1.08 \div 300$.	21. Express $\dfrac{4}{x} - \dfrac{5}{2x+1}$ as a single fraction in its simplest form.
7. Calculate $(-35) \div (-7)$.	22. Simplify $\dfrac{p^3 \times 4p^{-2}}{2p^{-3}}$.
8. Calculate $-24 \times (-6)$.	23. Expand and simplify $s^2(t^2 - 4s) + s(2s + t)^2$.
9. Calculate 30% of £0.80.	24. Solve the inequation $6 - (4 - x) \geq 9x + 18$.
10. Calculate $16 - (-56)$.	25. Express $\sqrt{44} + \sqrt{99} + \sqrt{176}$ as a single surd in its simplest form.
11. Calculate $3\frac{1}{2} + 4\frac{5}{8}$.	26. Simplify $2r^{-2}\left(\dfrac{1}{2r} - 2r\right)$.
12. Calculate $\frac{5}{6} \times 1\frac{1}{3}$.	27. Solve the equation $\dfrac{2 - 4x}{5} = \dfrac{4 - x}{2} - 1$.
13. Calculate $3\frac{1}{4} \div 2\frac{1}{6}$.	28. Express $\dfrac{5}{3 - \sqrt{2}} - \dfrac{2}{3 + \sqrt{2}}$ as a single fraction with a rational denominator.
14. Calculate $\left(\dfrac{2}{3} \times \dfrac{3}{5} - \dfrac{1}{3}\right) \div \dfrac{1}{12}$	29. Solve the system of equations $4e + 5f = 8$, $3e - 2f = -17$
15. Calculate $8 \times 4.8 - (6.4 \div 2)$.	30. Find the equation of the parabola shown below. 

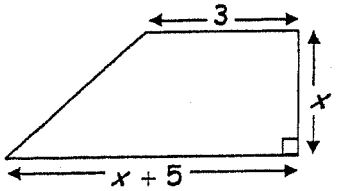
SET 20 (CREDIT)

- Questions 1 to 10 should be done ***mentally***
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 440×500.	16. A line passes through the point $(-2, 5)$ and has gradient 3. What is the equation of the line?
2. Calculate 6000×2.8.	17. Calculate the height of the triangle shown.  3 cm
3. Calculate $8.8 - 2.99$.	18. Make t the subject of the formula $P = 4 - \sqrt{\frac{Q}{t}}$.
4. Calculate $27.78 \div 6$.	19. Simplify $\frac{9p^2 - 25}{3p^2 - 5p}$.
5. Calculate $\frac{5}{6}$ of 96.	20. Simplify $a^{2/3}\left(a^{-1/3} - a^{1/3}\right)$.
6. Calculate $22.6 \div 2000$.	21. Express $\sqrt{98} - \sqrt{18} + \sqrt{2}$ as a single surd in its simplest form.
7. Calculate $33 \div (-3)$.	22. Solve the equation $x(x + 4) = -3$.
8. Calculate -28×4.	23. Solve the equation $4(1 - x) - 2(3x + 1) = 22$.
9. Calculate 60% of £18.	24. Express $\frac{6}{\sqrt{7} - 3}$ as a fraction with a rational denominator.
10. Calculate $7.4 - (-8.6)$.	25. Simplify $\frac{3x^5 \times 4x^{-4}}{x^2}$.
11. Calculate $1\frac{3}{4} \div 2\frac{1}{5}$.	26. Solve the system of equations $3r + s = 9$, $r - 2s = -\frac{1}{2}$.
12. Calculate $3\frac{1}{2} \times \frac{3}{7}$.	27. Solve the equation $\frac{3}{x - 2} - \frac{1}{x - 1} = \frac{7}{6}$.
13. Calculate $6\frac{2}{5} \div 1\frac{3}{5}$.	28. Express $\frac{5x + 3}{2} - \frac{2x + 1}{3}$ as a single fraction.
14. Calculate $\left(1\frac{2}{3} - \frac{1}{6}\right) \times \frac{3}{4}$.	29. A parabola has equation $f(x) = 4x^2 - 4x - 15$. Find where it crosses the x-axis.
15. Calculate $(6.8 - 2) \times 30 - 5.2$.	30. A function is defined by $g(x) = 16^x$. Find $g\left(\frac{3}{4}\right)$.

SET 21 (CREDIT)

- Questions 1 to 10 should be done ***mentally***
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 82×700.	16. A square based pyramid has volume $500\ \text{cm}^3$. It has height 6 cm. Find the length of the edge of the base, expressing your answer as a surd in its simplest form.
2. Calculate 9000×5.2.	17. Calculate the lengths of the sides in the trapezium, given that its area is $10\ \text{cm}^2$. 
3. Calculate $11.24 - 5.5$.	18. Simplify $\dfrac{x^3 - 2x^2}{x^2 - 5x + 6}$.
4. Calculate $46.16 \div 8$.	19. Solve the equation $x - 2(3 - x) = 10 - x$.
5. Calculate $\frac{3}{4}$ of 90.	20. Solve the equation $\dfrac{4 - 2x}{3} = \dfrac{3 - 5x}{6}$.
6. Calculate $30.4 \div 200$.	21. Express $\dfrac{2}{x} - \dfrac{1}{x + 2}$ as a single fraction.
7. Calculate $68 \div (-4)$.	22. Simplify $v\left(\dfrac{1}{v} - \sqrt{v}\right)$.
8. Calculate $76 \times (-8)$.	23. Simplify $\dfrac{6x \times x^{-2}}{x^{-1}}$.
9. Calculate 80% of 1.6.	24. Express $\dfrac{5}{\sqrt{6} - \sqrt{3}}$ as a fraction with a rational denominator.
10. Calculate $33 - (-12)$.	25. Express $\sqrt{243} - \sqrt{147} - \sqrt{75}$ as a single surd in its simplest form.
11. Calculate $8\frac{1}{4} - 3\frac{5}{6}$.	26. Solve the equation $\dfrac{2x + 1}{5} - \dfrac{x + 4}{10} = \dfrac{1}{10}$.
12. Calculate $2\frac{2}{3} \times \frac{3}{5}$.	27. Sketch the parabola with equation $y = x^2 - x - 20$, showing clearly its turning point and the places where it crosses the co-ordinate axes.
13. Calculate $9\frac{1}{3} \div \frac{7}{12}$.	28. Express $\dfrac{10}{\sqrt{9x^2}}$ in index form.
14. Calculate $7 - 3\frac{1}{3} \times \frac{9}{20}$.	29. Express the equation of the line $3y - 2x + 5 = 0$ in the form $y = mx + c$.
15. Calculate $8.4 \div 3 \times 50$.	30. Show that the point $(-2, -7)$ lies on the line $y = 2x - 3$.

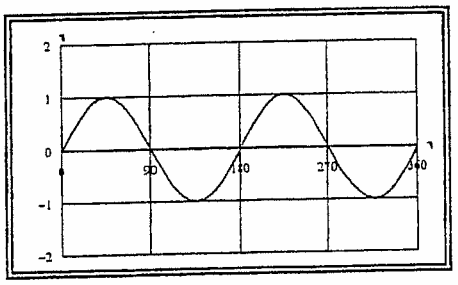
SET 22 (CREDIT)

- Questions 1 to 10 should be done *mentally*
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 36×800.	16. Show that $\dfrac{1 - 2\sin^2 x^\circ}{\cos^2 x^\circ} = 1 - \tan^2 x^\circ$.
2. Calculate 0.25×50.	17. Find the point of intersection of the lines $2y - x - 9 = 0$ and $2x + 3y = 10$.
3. Calculate $9.43 \div 3.8$.	18. Make d the subject of the formula $V = \left(\dfrac{d}{t} - 2\right)^2$.
4. Calculate $27.44 \div 8$.	19. Solve the equation $x^2 = 4 - 3x$.
5. Calculate $\dfrac{2}{7}$ of 98.	20. Express $\dfrac{3 - x}{2} + \dfrac{2x - 1}{3}$ as a single fraction.
6. Calculate $12.9 \div 300$.	21. Simplify $4x^{-2}\left(\dfrac{1}{2x} + 3x^2\right)$.
7. Calculate $(-40) \div (-5)$.	22. Solve the equation $15 - 4x = 8 - (7 - 3x)$.
8. Calculate $47 \times (-5)$.	23. Express $\sqrt{54} + \sqrt{24}$ as a single surd in its simplest form.
9. Calculate 90% of £2.80.	24. Solve the equation $\dfrac{2x + 7}{5} + \dfrac{20 - 6x}{10} = 4$.
10. Calculate $-76 + (-27)$.	25. Expand and simplify $(2y + 1)(y - 1)^2 - y^2(2y - 3)$.
11. Calculate $\dfrac{7}{8} + 2\dfrac{1}{4}$.	26. Express $\dfrac{2}{\sqrt{8} - \sqrt{5}}$ as a fraction with a rational denominator.
12. Calculate $\dfrac{3}{5} \times 1\dfrac{1}{9}$.	27. Solve the system of equations $4y - 3x = 23$, $2y + 5x = -21$.
13. Calculate $\left(3\dfrac{1}{4} - 2\dfrac{1}{8}\right) \times \dfrac{1}{9}$.	28. A function is defined by $f(x) = \tan x^\circ \div \cos x^\circ$. Evaluate $f(30)$, expressing your answer as a fraction with a rational denominator.
14. Calculate $\left(2 - \dfrac{2}{5}\right) \div 2\dfrac{2}{3}$.	29. Simplify $\dfrac{2x^2 + 5x + 2}{x^2 + 3x + 2}$.
15. Calculate $(60 - 9.6 \times 6) \times 2$.	30. Express $\dfrac{x^2 - 2x + 1}{\sqrt{x}}$ in index form.

SET 23 (CREDIT)

- Questions 1 to 10 should be done ***mentally***
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 320×500.	16. Hamish walks a distance d km at a speed of 3 kph. He walks a second distance which is 6 km more than three times the first, at 5 kph. If Hamish walks for 4 hours in total, calculate the total distance he has walked.
2. Calculate 0.012×8000.	17. A plane flew 760 miles in 1 hour 36 mins. How fast was it travelling?
3. Calculate $7.65 \div 8.5$.	18. Simplify $\dfrac{16z^2 - 81}{4z^2 - z - 18}$.
4. Calculate $39.34 \div 7$.	19. Solve the equation $3x^2 - 13x - 10 = 0$.
5. Calculate $\frac{3}{8}$ of 144.	20. Express $\dfrac{24}{\sqrt{9y^3}}$ in index form.
6. Calculate $3.6 \div 400$.	21. The graph below has equation $y = a \sin bx°$. Find the values of a and b. 
7. Calculate $(-144) \div 12$.	22. Solve the equation $4 \sin^2 x° - 3 = 0$, for $0 \le x \le 360$.
8. Calculate $(-15) \times (-15)$.	23. Given that $\tan A = \dfrac{2}{\sqrt{7}}$, find the exact values of $\sin A$ and $\cos A$.
9. Calculate 45% of 500.	24. Sketch the parabola with equation $y = 16 - (x - 4)^2$, showing clearly all relevant points.
10. Calculate $102 - (-59)$.	25. Expand and simplify $\left(\dfrac{x}{2} - \dfrac{2}{x}\right)^2$.
11. Calculate $7\frac{1}{8} - 4\frac{1}{6}$.	26. Solve the equation $\dfrac{2y}{3} + \dfrac{y+1}{9} = -1$.
12. Calculate $1\frac{1}{20} \times \frac{5}{7}$.	27. Express $\sqrt{50} + \sqrt{18}$ as a single surd in its simplest form.
13. Calculate $1\frac{3}{5} \div \frac{16}{25}$.	28. Solve the equation $6p - (3 - p) = 19 - 2(6 - p)$.
14. Calculate $\left(4\frac{1}{3} \times \frac{9}{26}\right) \div \frac{1}{2}$.	29. Express $\dfrac{6}{x+1} - \dfrac{3}{x-1}$ as a single fraction.
15. Calculate $7.8 \div 2 \times 40$.	30. Solve the system of equations $3s - 2r = 7$, $6s - 3r = 11$.

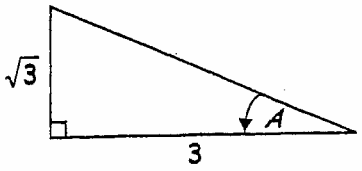
SET 24 (CREDIT)

- Questions 1 to 10 should be done ***mentally***
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 7000×32.	16. In a cube, calculate the ratio of the length of a space diagonal to that of an edge.
2. Calculate 0.08×700.	17. Make y the subject of the formula $x = \sqrt{\dfrac{y}{3-y}}$.
3. Calculate $11.82 - 3.7$.	18. Show that $\sqrt{8 + 2\sqrt{15}} = \sqrt{5} + \sqrt{3}$.
4. Calculate $57.54 \div 7$.	19. Simplify $\dfrac{p^2 + 2pq + q^2}{p^2 - q^2}$.
5. Calculate $\dfrac{2}{5}$ of £1.80.	20. Solve the equation $(x+1)(x-2) = 4$.
6. Calculate $0.9 \div 30$.	21. Solve the equation $30 - 5(2 - x) = 4(1 - 3x) - 1$.
7. Calculate $72 \div (-9)$.	22. Express $\sqrt{175} - \sqrt{63}$ as a single surd in its simplest form.
8. Calculate $26 \times (-5)$.	23. Express $\dfrac{(x+2)^2}{\sqrt{x}}$ in index form.
9. Calculate 20% of £26.	24. Expand and simplify $(2k+3)(k^2 + 4k - 3)$.
10. Calculate $84 \div (-36)$.	25. Solve the equation $\dfrac{3p-1}{5} - \dfrac{2-5p}{4} = 3$.
11. Calculate $4\dfrac{1}{2} - 3\dfrac{1}{3} + 1\dfrac{1}{6}$.	26. Express $\dfrac{1}{4-\sqrt{2}}$ as a fraction with a rational denominator.
12. Calculate $\dfrac{5}{6} \div \dfrac{5}{8}$.	27. Simplify $3x^{2/3} \times 5x^{-1}$.
13. Calculate $3\dfrac{3}{4} \times \dfrac{4}{9}$.	28. Express $\left(\sqrt[5]{9r}\right)^4$ in index form.
14. Calculate $\dfrac{3}{4} \div \left(\dfrac{6}{10} - \dfrac{1}{5}\right)$.	29. A function is defined by $g(x) = \sqrt{x}$. Calculate $g(28)$, expressing your answer as a surd in its simplest form.
15. Calculate $8 \times 1.5 \div 3 + 6.6$.	30. Solve the system of equations $8y + 5x = 19$, $4y - 5x = 17$.

SET 25 (CREDIT)

- Questions 1 to 10 should be done ***mentally***
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 24×8000.	16. A cube has edge length x cm. A cuboid has length x cm, breadth $(x-2)$ cm and height $(x+4)$ cm. Find the value(s) of x for which the cube and cuboid have equal volume.
2. Calculate 11.5×200.	17. Using the information given below, find the exact value of $\sin^2 A° - \cos^2 A°$. 
3. Calculate $3.73 - 1.24$.	18. Make v the subject of the formula $\frac{5}{t} = vx - vy$.
4. Calculate $25.38 \div 6$.	19. Express $\sqrt{99} - \sqrt{44}$ as a single surd in its simplest form.
5. Calculate $\frac{1}{4}$ of £3.	20. Simplify $\frac{x^2 + 3x - 10}{2x - 4}$
6. Calculate $4.9 \div 70$.	21. Express $\frac{6}{y-2} - \frac{3}{y+2}$ as a single fraction.
7. Calculate $8 \div (-1)$.	22. Solve the equation $\frac{x}{5} = \frac{2(x+4)}{15}$.
8. Calculate $(-12) \times (-4)$.	23. Simplify $\frac{9u^{-2} \times 3u^{-5}}{u^2}$.
9. Calculate 15% of £3.40.	24. Expand and simplify $(4pq)^2 - q^2(p-2)^2$.
10. Calculate $(-88) - (-8)$.	25. Solve the equation $6(2x+1) - 3(2-x) = 11x + 16$
11. Calculate $7\frac{2}{3} - 5\frac{1}{2}$.	26. Express $\frac{9y}{\sqrt{16y^3}}$ in index form.
12. Calculate $2\frac{2}{5} \times \frac{5}{8}$.	27. Solve the equation $6x - 10 = \frac{4}{x}$.
13. Calculate $1\frac{7}{8} \div 3\frac{3}{4}$.	28. Express $\frac{4}{7-\sqrt{6}}$ as a fraction with a rational denominator.
14. Calculate $\left(\frac{3}{5} \div \frac{1}{2} - \frac{3}{4}\right) \div \frac{1}{4}$.	29. Solve the system of equations $4x - 5y = 12$ $6x + y = 1$
15. Calculate $\left(\frac{3}{4} - \frac{1}{6}\right)$ of $\frac{3}{7}$.	30. Sketch the parabola with equation $y = x^2 - 4x + 3$, showing clearly all relevant points.

SET 26 (CREDIT)

- Questions 1 to 10 should be done ***mentally***
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 340×800.	16. The square of a number is twice that number add 8. Find the number(s).
2. Calculate 0.06×5000.	17. Solve the equation $\frac{4-q}{2} + \frac{2-q}{3} = 7$.
3. Calculate $7.92 - 4.5$.	18. Simplify $\frac{(x+1)^2}{x^2+x}$.
4. Calculate $15.34 \div 4$.	19. Factorise fully $3m^2 - 48$.
5. Calculate $\frac{5}{9}$ of £3.60.	20. Express $\sqrt{320} - \sqrt{80}$ as a single surd in its simplest form.
6. Calculate $10.05 \div 50$.	21. Express $\frac{2+x}{5} - \frac{3x-1}{2}$ as a single fraction.
7. Calculate $27 \div (-3)$.	22. Solve the equation $\tan^2 x° = \frac{1}{3}$, $0 \le x \le 360$.
8. Calculate $48 \times (-7)$.	23. Expand and simplify $m(m-2n)(m+2n) - m^3(1-n)$.
9. Calculate $2\frac{1}{2}$% of £150.	24. Solve the equation $\frac{1}{2}(3x+2) - \frac{2}{3}(x+5) = 1$.
10. Calculate $61 - (-39)$.	25. Simplify $\frac{b^{-2} \times b}{b^2}$.
11. Calculate $10\frac{1}{5} - 6\frac{1}{3}$.	26. Solve the system of equations $5x - 6y = 9$, $x + 5y = -23$.
12. Calculate $5\frac{5}{8} \times \frac{4}{9}$.	27. Express $\frac{8}{3-\sqrt{3}}$ as a fraction with a rational denominator.
13. Calculate $\frac{4}{7} \div \frac{16}{21}$.	28. Expand and simplify $\left(2x - \frac{1}{x}\right)^2$.
14. Calculate $\left(\frac{2}{3} \times 2\frac{1}{4}\right) \div \frac{1}{8}$.	29. Sketch the parabola $y = 2x^2 - 5x + 2$, showing clearly all relevant points.
15. Calculate $40 \times 1.6 \div 2 \times 3$.	30. Find the points of intersection of the curves $y = 2x^2 + 3x - 7$ and $y = x^2 + 4x - 1$.

SET 27 (CREDIT)

- Questions 1 to 10 should be done ***mentally***
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 400×280.	16. One cube has edge length $\sqrt{3}$ cm and another has edge length $2\sqrt{2}$ cm. Show that the ratio of their volumes (large to small) is $\frac{8\sqrt{6}}{9}$.
2. Calculate 8.3×600.	17. A cylindrical pipe, filled with water, has radius 4 cm. Water is being released from the pipe at the rate of 20 cm^3 per second. If it takes 3 minutes to completely empty the pipe, find the length of the pipe.
3. Calculate $3.72 - 1.65$.	18. Make P the subject of the formula $T = \sqrt{\frac{P}{3-P}} + 2$.
4. Calculate $34.32 \div 6$.	19. Simplify $\frac{3p+6}{p^2-4}$.
5. Calculate $\frac{7}{8}$ of 8.8.	20. Solve the equation $5x - \frac{3}{x} = 2$.
6. Calculate $0.56 \div 80$.	21. Expand and simplify $(m^2 - n^2)^2 - m^2n^2\left(2 - \frac{n^2}{m^2}\right)$.
7. Calculate $(-32) \div (-4)$.	22. Solve the system of equations $\frac{x}{2} - \frac{y}{4} = 4$, $\frac{3x}{2} + \frac{3y}{2} = 3$.
8. Calculate $90 \times (-8)$.	23. Solve the equation $\frac{5x-2}{3} - \frac{x-1}{6} = 4$.
9. Calculate $1\frac{1}{4}\%$ of £8.	24. Express $\frac{6}{\sqrt{5}-2}$ as a fraction with a rational denominator.
10. Calculate $(-27) - (-45)$.	25. Expand and simplify $\sqrt{a}(2a - a^{-1})$.
11. Calculate $8\frac{2}{3} - 5\frac{1}{2}$.	26. Solve the inequation $3 - (7 - 2x) \geq 3x - 10$.
12. Calculate $\frac{5}{12} \times 1\frac{1}{5}$.	27. Express $\sqrt{108} - \sqrt{12} + \sqrt{48}$ as a single surd in its simplest form.
13. Calculate $\left(4\frac{2}{3} - \frac{5}{6}\right) \div \frac{1}{6}$.	28. Solve the equation $\frac{x+4}{x+1} - \frac{x-3}{x+2} = 0$.
14. Calculate $\left(3\frac{3}{10} \times \frac{5}{11}\right) - \frac{1}{4} \times \frac{2}{5}$.	29. Simplify $\frac{7p^2 \times 2p^{-1}}{p^3}$
15. Calculate $(5.4 - 2.6) \times 30$.	30. y varies directly as the square of x. When $y = 4$, $x = 3$. Write down a relationship connecting x and y and hence find y when $x = \frac{3}{4}$.

SET 28 (CREDIT)

- Questions 1 to 10 should be done *mentally*
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 320×300.	16. Given that $y - 2 = \sqrt{\dfrac{\sqrt{x} - 2}{\sqrt{x} + 2}}$, show that $x = \left(\dfrac{2\left[1 + (y-2)^2\right]}{1 - (y-2)^2}\right)^2$ (Tricky!!!)
2. Calculate 1.2×500.	17. A function is defined by $f(x) = 2x^{1/3} - 5$. Find the value of x such that $f(x) = 1$.
3. Calculate $7.87 - 3.9$.	18. Simplify $\dfrac{2p^2 + 3p - 9}{4p - 6}$.
4. Calculate $51.72 \div 6$.	19. Solve the equation $12x^2 - 5x - 25 = 0$.
5. Calculate $\dfrac{5}{8}$ of 72.	20. Express $\dfrac{3}{\sqrt{6} - 2}$ as a fraction with a rational denominator.
6. Calculate $24.6 \div 60$.	21. Express $\sqrt{32} + \sqrt{8}$ as a single surd.
7. Calculate $(-42) \div (-3)$.	22. Solve the equation $5(4 - 3x) - 2(2x - 1) = 2 - 9x$.
8. Calculate $(-18) \times (-5)$.	23. Solve the equation $\dfrac{x+5}{4} + \dfrac{2x+1}{12} = 3$.
9. Calculate 30% of £2500.	24. Make p the subject of the formula $q = 6 - \dfrac{p^2}{3}$.
10. Calculate $(-38) + (-26)$.	25. Expand and simplify $(x - 2y)^3$.
11. Calculate $12\dfrac{1}{5} - 8\dfrac{2}{3}$.	26. Solve the system of equations $7c + 5d = 1$, $3c + 4d = 6$
12. Calculate $2\dfrac{1}{7} \times \dfrac{14}{15}$.	27. Simplify $\dfrac{4z^4 \times 2z^{-2}}{z^{-1}}$.
13. Calculate $\left(6\dfrac{2}{5} \times 2\dfrac{1}{2}\right) \div \dfrac{1}{6}$.	28. Express $\dfrac{3x - 2}{4} + \dfrac{2 - x}{5}$ as a single fraction in its simplest form.
14. Calculate $\left(1\dfrac{1}{10} \times \dfrac{4}{11}\right) \div \dfrac{3}{8}$.	29. Factorise fully $2q^2 - 50$.
15. Calculate $80 - 3.2 \times 20$.	30. A function is defined by $h(x) = 3x^{2/3}$. Evaluate $h(64)$.

SET 29 (CREDIT)

- Questions 1 to 10 should be done ***mentally***
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 9000×270.	16. Solve the equation $\dfrac{2}{1-\dfrac{1}{1-\dfrac{1}{x}}} = -6$.
2. Calculate 6.8×20.	17. Solve the equation $x^3 = \dfrac{16}{x^2}$.
3. Calculate $12.34 - 6.7$.	18. Simplify $\dfrac{q^2 - 1}{q^2 + 3q - 4}$.
4. Calculate $28.92 \div 4$.	19. Express $\sqrt{96} - \sqrt{24}$ as a single surd.
5. Calculate $\dfrac{3}{10}$ of 75.	20. Express $\dfrac{2}{x+4} - \dfrac{1}{2x-3}$ as a single fraction in its simplest form.
6. Calculate $7.4 \div 2000$.	21. Solve the equation $\dfrac{4(2x-3)}{3} = \dfrac{7(x+7)}{9}$.
7. Calculate $75 \div (-5)$.	22. Express $\dfrac{10}{\sqrt{3}-1}$ as a fraction with a rational denominator.
8. Calculate $(-43) \times 8$.	23. Solve the equation $8 - 3(4 - 5x) = 10x + 6$.
9. Calculate 15% of £2.40.	24. Solve the system of equations $2y + z = 9$, $3y + 2z = 16$.
10. Calculate $(-72) \div (-19)$.	25. Expand and simplify $(3p-2)^2 - (p+3)(p+5)$.
11. Calculate $4\frac{5}{8} - 2\frac{3}{4}$.	26. Simplify $\dfrac{8x^2 \times x^{-4}}{x^{-2}}$.
12. Calculate $3\frac{2}{5} \times \frac{25}{34}$.	27. Expand and simplify $3p^{-1}(2p^{-2} - p^2)$.
13. Calculate $\frac{4}{9} \div \frac{2}{3}$.	28. Make l the subject of the formula $V = \dfrac{2 - 3l}{4}$.
14. Calculate $3\frac{1}{8} - \frac{3}{4} \div 2\frac{2}{3}$.	29. Find the co-ordinates of the turning point of the graph $y = x^2 - 4x - 12$.
15. Calculate $100 - 40 \times 2.3 + 5.5$.	30. Find the point of intersection of the lines $y - 2x = 7$ and $y + 3x + 3 = 0$.

SET 30 (CREDIT)

- Questions 1 to 10 should be done ***mentally***
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 780×200.	16. Sketch the graph of $y = 3\sin 2x^\circ$, for $0 \le x \le 360$.
2. Calculate 10.4×300.	17. Prove that $\sin^2 x + \cos^2 = 1$.
3. Calculate $8.73 - 5.9$.	18. Simplify $\dfrac{p^2 - 6p + 8}{p^2 + 3p - 10}$.
4. Calculate $21.84 \div 8$.	19. The formula for the volume of a sphere is $V = \dfrac{4}{3}\pi r^3$. What is the effect on V if r is halved?
5. Calculate $\dfrac{1}{5}$ of 250.	20. Make f_2 the subject of the formula $p = \dfrac{f_1 + f_2}{f_1 f_2}$.
6. Calculate $14.8 \div 40$.	21. Solve the equation $y = \dfrac{2}{y}(5y - 12)$.
7. Calculate $92 \div (-2)$.	22. Fully factorise $4s^5 - s$.
8. Calculate $(-4) \times (-28)$.	23. Express $\dfrac{4}{\sqrt{7} - 2}$ as a fraction with a rational denominator.
9. Calculate 70% of 3.5 litres.	24. Express $\sqrt{75} - \sqrt{27}$ as a single surd in its simplest form.
10. Calculate $82 - (-34)$.	25. P varies directly as Q and inversely as the square of R. Write down a formula connecting P, Q and R.
11. Calculate $7\dfrac{1}{6} - 5\dfrac{1}{9}$.	26. Solve the inequation $7(1 - 3y) \ge 5y - 5(6y + 1)$
12. Calculate $2\dfrac{3}{4} \times 1\dfrac{5}{11}$.	27. Express $\dfrac{3}{x^2} + \dfrac{5}{x^4}$ as a single fraction.
13. Calculate $\left(\dfrac{2}{3} \div \dfrac{5}{8}\right) \times 1\dfrac{1}{4}$.	28. Simplify $\dfrac{9z^2 \times 2z^{-1}}{6z^{-2}}$.
14. Calculate $\left(3\dfrac{1}{3} \div \dfrac{5}{6}\right) \div \dfrac{5}{12}$.	29. Expand and simplify $p^2(p^2 - q^2) - pq(1 - pq)$.
15. Calculate $(15 - 6.8) \times 20$.	30. Solve the equation $\sin x^\circ = \cos x^\circ$, for $0 \le x \le 360$.

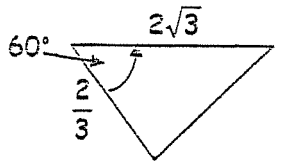
SET 31 (CREDIT)

- Questions 1 to 10 should be done *mentally*
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 47×2000.	16. Find the values of x, y and z such that: $2x - y + 3z = 20$, $x + 2y - z = -5$, $3x + y - 2z = -1$
2. Calculate 6.2×80.	17. Solve the equation $4\sin^2 x^\circ + 1 = 4$, for $0 \le x \le 360$.
3. Calculate $12.69 - 5.24$.	18. Simplify $\dfrac{x^4 + x^2}{x^3 + x}$.
4. Calculate $39.28 \div 4$.	19. Make z the subject of the formula $y = \dfrac{4 - z}{3}$.
5. Calculate $\dfrac{3}{8}$ of 56.	20. Express $\dfrac{8}{\sqrt{7} - 3}$ as a single fraction with a rational denominator.
6. Calculate $0.6 \div 3000$.	21. Express $\sqrt{500} - \sqrt{125}$ as a single surd in its simplest form.
7. Calculate $(-36) \div (-4)$.	22. a varies directly as the square of b and inversely as the cube of c. What is the effect on a if: (i) b is doubled (ii) c is halved?
8. Calculate $37 \times (-7)$.	23. Solve the equation $8 - 3(2x - 1) = 3 - 8x$.
9. Calculate 40% of 35 kg.	24. Express $\dfrac{3x + 1}{2} - \dfrac{x - 1}{5}$ as a single fraction in its simplest form.
10. Calculate $(-28) + (-18)$.	25. Expand and simplify $(r - s)(r + s)^2 - rs(r - s)$.
11. Calculate $8\dfrac{7}{8} - 6\dfrac{1}{4}$.	26. Solve the equation $\dfrac{5x - 3}{4} + \dfrac{x + 5}{2} = 7$.
12. Calculate $\left(\dfrac{3}{5} \times \dfrac{2}{3} - \dfrac{3}{10}\right) \div \dfrac{1}{4}$.	27. Simplify $\dfrac{q^{-5} \times 3q^3}{q^{-2}}$.
13. Calculate $\left(4\dfrac{1}{2} \times \dfrac{1}{3} \div \dfrac{2}{3}\right) - \dfrac{1}{4}$.	28. A parabola has equation $f(x) = 3x^2 - 10x + 8$. Find where it cuts the x-axis.
14. Calculate $5\dfrac{2}{11} \div \dfrac{19}{22}$.	29. Factorise $6y^2 + 7y - 20$.
15. Calculate $40 \times 6.3 - 48$.	30. Solve the equation $x^2 + 6x + 8 = 0$

SET 32 (CREDIT)

- Questions 1 to 10 should be done ***mentally***
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 960×20.	16. Sketch the graph with equation $y = 4\cos 3x^\circ + 2$, for $0 \le x \le 360$.
2. Calculate 2.4×6000.	17. A cuboid has volume $0.18\ \text{m}^3$. The base has dimensions 80 cm by 50 cm. Calculate the height of the cuboid.
3. Calculate $2.97 \div 1.7$.	18. Solve the equation $6x^2 + 7x - 24 = 0$.
4. Calculate $17.28 \div 6$.	19. Simplify $\dfrac{4z^2 - 16}{z + 2}$.
5. Calculate $\dfrac{4}{7}$ of 98.	20. Express $\dfrac{2}{3\sqrt{2} - 4}$ as a fraction with a rational denominator.
6. Calculate $18.6 \div 300$.	21. Express $\sqrt{98} - \sqrt{72}$ as a single surd in its simplest form.
7. Calculate $(-72) \div (-4)$.	22. Solve the equation $2(1 - 3y) - 5y = 14 - 8y$.
8. Calculate $9 \times (-23)$.	23. Express $\dfrac{7x - 3}{4} - \dfrac{5 - 2x}{8}$ as a single fraction in its simplest form.
9. Calculate 60% of £30.	24. Solve the equation $\dfrac{4 - 2x}{5} = \dfrac{9 - 7x}{15}$.
10. Calculate $(-57) - (-16)$.	25. Simplify $\dfrac{7p^5 \times 2p^{-2}}{p^{-3}}$.
11. Calculate $4\dfrac{1}{5} + 3\dfrac{2}{3}$.	26. Expand and simplify $3p^{-1}\left(\dfrac{1}{3p} - p^2\right)$.
12. Calculate $\dfrac{7}{9} \times 1\dfrac{13}{14}$.	27. Expand and simplify $(2x - 1)(x + 4) - (x - 3)(x - 2)$.
13. Calculate $8\dfrac{2}{3} \div \dfrac{13}{15}$.	28. Sketch the parabola with equation $y = x^2 + 4x - 12$, showing all relevant points.
14. Calculate $\dfrac{4}{5}$ of $\left(\dfrac{3}{8} - \dfrac{1}{3}\right)$.	29. Find the area of the triangle shown below. 
15. Calculate $(9.6 - 5.8) \div 2 \times 60$.	30. Make z the subject of the formula $B = \dfrac{z^2}{d} + g$.

SET 33 (CREDIT)

- Questions 1 to 10 should be done ***mentally***
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 8000×36.	16. Find the co-ordinates of the points where the graphs $y = \sin^2 x°$ and $y = \cos^2 x°$ meet, for $0 \le x \le 360$.
2. Calculate 3.7×400.	17. A cylinder with a base and a lid has volume $250\ \text{cm}^3$. Show that the surface area of the cylinder is $S = 2\pi r^2 + \frac{500}{r}$.
3. Calculate $13.14 - 6.8$.	18. Factorise fully $m^2n^4 - m^2n^2$.
4. Calculate $19.26 \div 3$.	19. Simplify $\frac{q^2 - 25}{q^2 - q - 20}$.
5. Calculate $\frac{5}{7}$ of 105.	20. Solve the equation $x + 3 = \frac{7x - 3}{x}$.
6. Calculate $0.56 \div 70$.	21. Express $\frac{9}{\sqrt{5}}$ as a fraction with a rational denominator.
7. Calculate $(-49) \div (-7)$.	22. Express $\frac{1}{2x + 3} - \frac{2}{x - 2}$ as a single fraction.
8. Calculate $8 \times (-34)$.	23. Express $\sqrt{27} + \sqrt{12} - \sqrt{3}$ as a single surd in its simplest form.
9. Calculate 25% of 1.8 kg.	24. Solve the inequation $2(3x - 5) - 4(1 - x) \le 3x$.
10. Calculate $(-43) + (-18)$.	25. Solve the equation $\frac{4}{3p - 1} = \frac{7}{4p + 2}$.
11. Calculate $9\frac{4}{5} - 3\frac{5}{6}$.	26. Simplify $\frac{8y^{1/2} \times 3y}{2y^{-1}}$.
12. Calculate $\frac{5}{14} \times \frac{28}{35}$.	27. Expand and simplify $(3x + 2)(2x - 3)(x + 4)$.
13. Calculate $\left(4\frac{3}{4} + \frac{1}{3}\right) \times \frac{3}{5}$.	28. Expand and simplify $b^{1/2}(2b - b^{-1/2})$.
14. Calculate $\frac{2}{3}$ of $\left(\frac{1}{4} - \frac{1}{5}\right)$.	29. x varies inversely as the square root of y. What is the effect on x if y is quartered?
15. Calculate $2.4 \times 60 \div 6 - 5.8$.	30. Sketch the parabola with equation $y = (x - 3)^2 - 9$.

SET 34 (CREDIT)

- Questions 1 to 10 should be done ***mentally***
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 42×7000.	16. A computer bought 2 years ago is now worth £672. How much was it worth originally, given that its price has dropped by 30%?
2. Calculate 48.1×30.	17. A function is defined by $f(x) = 2x^2$. Find the value of x for which $f(x) = f(x+2)$.
3. Calculate $11.3 - 5.76$.	18. Simplify $\dfrac{p^2 - 8p + 12}{p^2 - 36}$.
4. Calculate $24.35 \div 5$.	19. Solve the equation $y = 3 + \dfrac{18}{y}$.
5. Calculate $\dfrac{6}{11}$ of 66.	20. Express $\dfrac{11}{3\sqrt{5} - 10}$ as a fraction with a rational denominator.
6. Calculate $7.2 \div 90$.	21. Express $\sqrt{360} - \sqrt{90}$ as a single surd in its simplest form.
7. Calculate $28 \div (-4)$.	22. Make r the subject of the formula $Q = \dfrac{rs}{r+s}$.
8. Calculate $37 \times (-6)$.	23. Solve the equation $6x = 5(2 - x) - 2(3 - 5x)$.
9. Calculate 90% of 35 kg.	24. Express $\dfrac{2x+1}{6} - \dfrac{x-3}{3}$ as a single fraction in its simplest form.
10. Calculate $(-62) + 45$.	25. Solve the equation $\dfrac{3y}{2} = \dfrac{6(y+3)}{y}$.
11. Calculate $3\dfrac{1}{2} + 2\dfrac{3}{5}$.	26. Expand and simplify $(3y - 1)(2y^2 - 7y + 6)$.
12. Calculate $\dfrac{5}{7} \times 2\dfrac{1}{3}$.	27. Simplify $\dfrac{3q^{-1} \times 4q^2}{2q^{-3}}$.
13. Calculate $\left(3\dfrac{3}{4} - 3\dfrac{1}{2}\right) \div \dfrac{7}{8}$.	28. Expand and simplify $q^2(2q^{-1} - q^{1/2})$.
14. Calculate $\dfrac{2}{3} \div 1\dfrac{3}{4} \times \dfrac{7}{16}$.	29. s varies inversely as the cube of t. What is the effect on s if t is doubled?
15. Calculate $(9.6 - 3.8) \times 40$.	30. Sketch the straight line with equation $y = -\dfrac{1}{2}x + 5$.

SET 35 (CREDIT)

- Questions 1 to 10 should be done ***mentally***
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 6000×180.	16. Find the co-ordinates of the points of intersection of the line $y = 2x + 1$ and the parabola $y = x^2 + 3x - 5$.
2. Calculate 2.4×500.	17. Express $\frac{1}{\sqrt{9x}}$ in index form.
3. Calculate $9.34 - 5.8$.	18. Make z the subject of the formula $P = \frac{\sqrt{z}}{2} - r$.
4. Calculate $57.68 \div 7$.	19. Simplify $\frac{6x^2 + 7x - 20}{3x^2 - 13x + 12}$.
5. Calculate $\frac{8}{9}$ of 108.	20. Factorise fully $8x^2y^2 - 32y^2$.
6. Calculate $5.6 \div 80$.	21. Solve the equation $18 - 6(2 - 3r) = 8(3r + 2) + 8$.
7. Calculate $(-64) \div (-8)$.	22. Express $\frac{9}{2\sqrt{5} - 4}$ as a fraction with a rational denominator.
8. Calculate $9 \times (-26)$.	23. Express $\sqrt{117} + \sqrt{52}$ as a single surd in its simplest form.
9. Calculate 20% of £2.60.	24. Express $\frac{5}{4x + 3} + \frac{3}{x - 4}$ as a single fraction in its simplest form.
10. Calculate $(-18) + (-36)$.	25. Solve the equation $\frac{6d}{5} = \frac{9(4d - 5)}{15}$.
11. Calculate $4\frac{3}{7} - 2\frac{1}{3}$.	26. Simplify $\frac{2x^{-1} \times 3x^{-2}}{6x^{-3} \times 3x}$.
12. Calculate $1\frac{1}{9} \times \frac{9}{10}$.	27. Expand and simplify $\sqrt{c}\left(\frac{1}{2}c - \frac{2}{c}\right)$.
13. Calculate $\left(\frac{4}{9} \div 1\frac{1}{3} \div \frac{1}{5}\right) \times 1\frac{1}{4}$.	28. Expand and simplify $(s - 2)(3s + 4)(s + 1)$.
14. Calculate $\left(\frac{3}{4} - \frac{1}{6}\right)$ of $\frac{6}{7}$.	29. Sketch the parabola with equation $y = 36 - 4(x - 2)^2$, showing clearly all relevant points.
15. Calculate $80 \times 0.4 \div 4$.	30. V varies directly as the cube of r and inversely as z. What is the effect on V if r is doubled and z is halved.

SET 36 (CREDIT)

- Questions 1 to 10 should be done *mentally*
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 88×4000.	16. Find the points of intersection of the curves $y = 3x^2 - 4x - 7$ and $y = x^2 + x + 5$.
2. Calculate 7.4×800.	17. Write down the gradient and y-intercept of the line $x - 4y = 5$.
3. Calculate $12.5 - 7.16$.	18. Make b the subject of the formula $Y = 2 - 3b^2$.
4. Calculate $21.92 \div 8$.	19. Simplify $\dfrac{4y + 8}{y^2 - 4}$.
5. Calculate $\dfrac{4}{7}$ of 84.	20. Express $\dfrac{3 - x}{4} - \dfrac{2x + 1}{3}$ as a single fraction in its simplest form.
6. Calculate $0.8 \div 400$.	21. Fully factorise $12x^2 - 10x - 42$.
7. Calculate $48 \div (-6)$.	22. Solve the equation $3p = (2 - p)(2 + p)$.
8. Calculate $(-9) \times (-9)$.	23. Express $\dfrac{10}{\sqrt{5} - \sqrt{3}}$ as a fraction with a rational denominator.
9. Calculate 40% of £250.	24. Express $\sqrt{200} - \sqrt{128}$ as a single fraction in its simplest form.
10. Calculate $(-68) - (-32)$.	25. Solve the equation $4(3x - 2) - 2(3 - x) = 10x + 6$.
11. Calculate $3\frac{1}{4} \div 5\frac{5}{6}$.	26. Solve the equation $\dfrac{3x - 4}{2} - 3 = \dfrac{5x - 2}{6}$.
12. Calculate $4\frac{2}{3} \times 2\frac{1}{7}$.	27. Simplify $\dfrac{10y^{-3} \times 4y^{-1}}{8y^2}$.
13. Calculate $\dfrac{5}{6} \div \dfrac{2}{3}$.	28. Expand and simplify $2\sqrt{x}\left(x^{3/2} - \dfrac{1}{x}\right)$.
14. Calculate $5\frac{1}{3} \div 1\frac{1}{3} - 2\frac{1}{5}$.	29. Expand and simplify $(3p - 1)(2p + 5)^2$.
15. Calculate $300 \times 0.2 \times 0.4$.	30. v varies directly as the square of w. What is the effect on v if w is trebled?

SET 37 (CREDIT)

- Questions 1 to 10 should be done ***mentally***
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 9000×26.	16. Sketch the parabola with equation $y = 2x^2 - x - 6$, showing clearly all relevant points.
2. Calculate 2.08×300.	17. Find where the line $y = 6x - 15$ meets the parabola $y = 2x^2 - 7x + 6$.
3. Calculate $19.4 - 8.78$.	18. Simplify $\dfrac{4x + 12}{x^2 - 2x - 15}$.
4. Calculate $51.12 \div 6$.	19. Express $\dfrac{8}{2\sqrt{2} - 3}$ as a fraction with a rational denominator.
5. Calculate $\dfrac{8}{9}$ of 63.	20. Express $\sqrt{108} - \sqrt{12} + \sqrt{75}$ as a single surd in its simplest form.
6. Calculate $6.3 \div 900$.	21. Express $\sqrt{12} \times \sqrt{8}$ as a surd in its simplest form.
7. Calculate $(-36) \div (-6)$.	22. Solve the equation $p(5 + 6p) = 4$.
8. Calculate $(-7) \times (-6)$.	23. Solve the equation $\dfrac{8}{2x + 3} - \dfrac{12}{5x} = 1$.
9. Calculate 30% of £10500.	24. Make f the subject of the formula $d = \dfrac{g}{f^2} - 1$.
10. Calculate $(-52) + 38$.	25. Solve the inequation $9x \geq 20 - 7(4 - x)$.
11. Calculate $9\dfrac{1}{3} + 7\dfrac{3}{4}$.	26. Simplify $\dfrac{8u^5 \times 6u^{-3}}{4u^{-1}}$.
12. Calculate $1\dfrac{1}{2} \times \dfrac{4}{9}$.	27. Expand and simplify $\left(x^{1/2} - 1\right)\left(\dfrac{1}{x} + 1\right)$.
13. Calculate $\dfrac{7}{8} \div \dfrac{21}{40}$.	28. Expand and simplify $3s(s - 2)^2 - s^2(3s - 4)$.
14. Calculate $\dfrac{2}{5}$ of $\left(2\dfrac{3}{4} - \dfrac{7}{8}\right)$.	29. Express $\dfrac{4y - 3}{5} - \dfrac{y + 2}{4}$ as a single fraction.
15. Calculate $(40 + 9.4) \div 4$.	30. A function is defined by $f(t) = t\sqrt{6}$. Evaluate $f\left(\sqrt{10}\right)$, expressing your answer a s a surd in its simplest form.

SET 38 (CREDIT)

- Questions 1 to 10 should be done ***mentally***
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 48×3000.	16. A cylinder has volume $1250\ \text{cm}^3$. Its radius is twice its height. Find the *exact* height of the cylinder.
2. Calculate 4.9×700.	17. Find where the graph of the function $f(x) = 2\sin x^\circ - 1$ meets the x-axis, for $0 \le x \le 360$.
3. Calculate $15.02 - 6.85$.	18. Simplify $\dfrac{(x-1)^2}{x^2 + 4x - 5}$.
4. Calculate $40.88 \div 7$.	19. Express $\dfrac{4}{3\sqrt{2} - 2\sqrt{3}}$ as a fraction with a rational denominator.
5. Calculate $\dfrac{2}{5}$ of £3.80.	20. Solve the equation $18 - 3x = x^2$.
6. Calculate $0.36 \div 60$.	21. Factorise fully $3p^4 - 48$.
7. Calculate $(-66) \div 3$.	22. Make v the subject of the formula $T = mgh + \dfrac{1}{2}mv^2$.
8. Calculate $44 \times (-6)$.	23. Express $\sqrt{180} + \sqrt{125}$ as a single surd in its simplest form.
9. Calculate 15% of £2500.	24. Solve the equation $8(2 - 5x) = 3(4 - x) - 5(7x - 2)$
10. Calculate $(-15) + (-27)$.	25. Express $\dfrac{2y+1}{7} - \dfrac{y-2}{3}$ as a single fraction.
11. Calculate $6\dfrac{2}{3} + 3\dfrac{1}{5}$.	26. Simplify $\dfrac{3x^{-3} \times 2x}{x^2}$.
12. Calculate $4\dfrac{1}{2} \times \dfrac{4}{15}$.	27. Expand and simplify $2y^2(3y^{-1} + y^{1/2})$.
13. Calculate $2\dfrac{2}{3} \div \dfrac{4}{9} - 3\dfrac{1}{7}$.	28. Expand and simplify $a(x + 2y)^2 - x^2(a - y)$.
14. Calculate $\left(8\dfrac{1}{2} - 5\dfrac{3}{4}\right) \times \dfrac{6}{11}$.	29. Sketch the parabola $y = (x+5)^2 - 25$.
15. Calculate $80.6 - 3.5 \times 20$.	30. Sketch the graph of the function $y = 3\sin 3x^\circ - 5$.

SET 39 (CREDIT)

- Questions 1 to 10 should be done ***mentally***
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 63×4000.	16. A rectangular classroom floor is 2 metres longer than it is wide. Find its length and width, given that the floor has area $48\ m^2$.
2. Calculate 7.2×50.	17. Show that $1 - 2\sin^2 x^\circ = \cos^2 x^\circ - \sin^2 x^\circ$.
3. Calculate $8.63 - 5.8$.	18. Simplify $\dfrac{2p + 16}{p^2 - 64}$.
4. Calculate $18.78 \div 6$.	19. Make u the subject of the formula $l = \dfrac{3 - u}{u}$.
5. Calculate $\dfrac{9}{10}$ of $0.35\ kg$.	20. Solve the equation $6x^2 - 3x - 30 = 0$.
6. Calculate $2.1 \div 70$.	21. Express $\dfrac{7}{\sqrt{3} - \sqrt{2}}$ as a fraction with a rational denominator.
7. Calculate $24 \div (-6)$.	22. Express $\sqrt{150} - \sqrt{54}$ as a single surd in its simplest form.
8. Calculate $6 \times (-16)$.	23. Factorise fully $m^2n^3 - 4m^2n$
9. Calculate 25% of £150.	24. Simplify $\dfrac{3z^{-4} \times 6z^2}{2z^{-2}}$.
10. Calculate $(-72) - (-56)$.	25. Express $\dfrac{5}{x} - \dfrac{3}{2x - 1}$ as a single fraction in its simplest form.
11. Calculate $8\dfrac{3}{5} + 6\dfrac{1}{8}$.	26. Solve the equation $9y - 3(4 - 5y) = 15y + 6$.
12. Calculate $1\dfrac{5}{7} \times 2\dfrac{1}{3}$.	27. Solve the equation $\dfrac{3(2x - 1)}{4} = \dfrac{9(x + 4)}{12}$.
13. Calculate $3\dfrac{1}{6} \times \dfrac{15}{19} \div \dfrac{1}{2}$.	28. Expand and simplify $\sqrt{p}\left(\dfrac{2}{\sqrt{p}} - p\right)$.
14. Calculate $\left(3\dfrac{1}{2} + 2\dfrac{3}{4}\right) \times 1\dfrac{3}{5}$.	29. Sketch the parabola $y = x^2 - 14x + 48$.
15. Calculate $100 + 30 \times 0.4$.	30. H varies directly as the square root of t. What is the effect on H if t is quadrupled ?

SET 40 (CREDIT)

- Questions 1 to 10 should be done ***mentally***
- You can use a pencil and paper if required for the remaining questions

QUESTION	QUESTION
1. Calculate 36×600.	16. Find where the curves $y = 2x^2 - 3x + 8$ and $y = x^2 + 4x - 4$ meet.
2. Calculate 3.6×8000.	17. A straight line passes through the points $(2, 10)$ and $(3, 13)$. Find its equation.
3. Calculate $7.24 - 2.9$.	18. Simplify $\dfrac{u^2 + 6u + 8}{u^2 + u - 12}$.
4. Calculate $34.5 \div 6$.	19. Make w the subject of the formula $T = 3 - \sqrt{\dfrac{w}{w+2}}$.
5. Calculate $\dfrac{3}{4}$ of 68.	20. Solve the equation $\dfrac{6}{x} = 5 - x$.
6. Calculate $0.32 \div 80$.	21. Factorise fully $6p^5 - 24p$.
7. Calculate $169 \div (-13)$.	22. Express $\dfrac{9}{\sqrt{7} - \sqrt{2}}$ as a fraction with a rational denominator.
8. Calculate $8 \times (-19)$.	23. Express $\sqrt{112} - \sqrt{63}$ as a single surd in its simplest form.
9. Calculate 40% of £24.	24. Express $\dfrac{4(2x-1)}{3} - \dfrac{3(1-2x)}{4}$ as a single fraction.
10. Calculate $(-26) + (-31)$.	25. Simplify $\dfrac{8y \times y^{-3}}{y^2}$.
11. Calculate $3\dfrac{4}{5} - 2\dfrac{5}{8}$.	26. Expand and simplify $(3x-2)^2 - 9x(x-2)$.
12. Calculate $8\dfrac{1}{3} \times \dfrac{9}{50}$.	27. Expand and simplify $c^{-2}(2c - \sqrt{c})$.
13. Calculate $3\dfrac{5}{8} \div 1\dfrac{13}{16}$.	28. Solve the equation $4(6-x) = 7x - 3(6x-1)$.
14. Calculate $\dfrac{1}{4} \div \dfrac{3}{8} \div \dfrac{5}{3}$.	29. Sketch the parabola $y = x^2 - 16$.
15. Calculate $2.9 \times 50 \div 5$.	30. Given that $A = \dfrac{l^2}{b}$, find the effect on A if l is trebled and b doubled.