Fortrose Academy

Mathematics Department

CfE Level 3

S2 Essential Skills

Homework Booklet

It is important that pupils establish a habit of regular practice to consolidate skills learned in class. This revision homework is best **restricted to three questions per night**. Full solutions are provided on our website. Pupils should mark their work each evening by referring to the solutions provided on-line, and to note the layout and rigour of the teacher solution. Pupils should complete all corrections. Shade question numbers in the checklist each night green, amber or red to monitor strengths and weaknesses, as shown:

S2 Maths Homework Checklist (Green/Amber/Red)																				
1	A	1	2	3	B	1	2	3	C	1	2	3	D	1	2	3	E	1	2	3
2	A	1	2	3	B	1	2	3	C	1	2	3	D	1	2	3	E	1	2	3

Pupils can refer back to red and orange shaded problems when revising for assessments.

Most questions do not require the use of a calculator.

Those that can be answered using a calculator are indicated by the symbol:

Name:

S2 Maths Homework Checklist (Green/Amber/Red)

1	A	1	2	3	B	1	2	3	C	1	2	3	D	1	2	3	E	1	2	3
2	A	1	2	3	B	1	2	3	C	1	2	3	D	1	2	3	E	1	2	3
3	A	1	2	3	B	1	2	3	C	1	2	3	D	1	2	3	E	1	2	3
4	A	1	2	3	B	1	2	3	C	1	2	3	D	1	2	3	E	1	2	3
5	A	1	2	3	B	1	2	3	C	1	2	3	D	1	2	3	E	1	2	3
6	A	1	2	3	B	1	2	3	C	1	2	3	D	1	2	3	E	1	2	3
7	A	1	2	3	B	1	2	3	C	1	2	3	D	1	2	3	E	1	2	3
8	A	1	2	3	B	1	2	3	C	1	2	3	D	1	2	3	E	1	2	3
9	A	1	2	3	B	1	2	3	C	1	2	3	D	1	2	3	E	1	2	3
10	A	1	2	3	B	1	2	3	C	1	2	3	D	1	2	3	E	1	2	3
11	A	1	2	3	B	1	2	3	C	1	2	3	D	1	2	3	E	1	2	3
12	A	1	2	3	B	1	2	3	C	1	2	3	D	1	2	3	E	1	2	3
13	A	1	2	3	B	1	2	3	C	1	2	3	D	1	2	3	E	1	2	3
14	A	1	2	3	B	1	2	3	C	1	2	3	D	1	2	3	E	1	2	3
15	A	1	2	3	B	1	2	3	C	1	2	3	D	1	2	3	E	1	2	3
16	A	1	2	3	B	1	2	3	C	1	2	3	D	1	2	3	E	1	2	3
17	A	1	2	3	B	1	2	3	C	1	2	3	D	1	2	3	E	1	2	3
18	A	1	2	3	B	1	2	3	C	1	2	3	D	1	2	3	E	1	2	3
19	A	1	2	3	B	1	2	3	C	1	2	3	D	1	2	3	E	1	2	3
20	A	1	2	3	B	1	2	3	C	1	2	3	D	1	2	3	E	1	2	3
21	A	1	2	3	B	1	2	3	C	1	2	3	D	1	2	3	E	1	2	3
22	A	1	2	3	B	1	2	3	C	1	2	3	D	1	2	3	E	1	2	3
23	A	1	2	3	B	1	2	3	C	1	2	3	D	1	2	3	E	1	2	3
24	A	1	2	3	B	1	2	3	C	1	2	3	D	1	2	3	E	1	2	3
25	A	1	2	3	B	1	2	3	C	1	2	3	D	1	2	3	E	1	2	3
26	A	1	2	3	B	1	2	3	C	1	2	3	D	1	2	3	E	1	2	3
27	A	1	2	3	B	1	2	3	C	1	2	3	D	1	2	3	E	1	2	3
28	A	1	2	3	B	1	2	3	C	1	2	3	D	1	2	3	E	1	2	3

Set 1

1A

1) Expand 3(5x + 2)

2) Estimate the answer to 5.92 x 33
3) On a numbered 8 sided dice what is P(3)?

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1B

1) Simplify 8d x 3e
2) Solve the equation 3w + 1 = 40
3) Calculate the mean, median, mode and range: 9, 10, 10, 10, 12, 16, 24

1C

1) Calculate $\dfrac{3}{5} \times \dfrac{2}{3}$

2) Simplify 38 ÷ 20
3) Copy and fill in the sizes of **all** missing angles.

118°
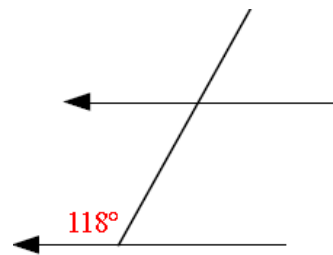
1D

1) Round to 2 decimal places 7.65137

2) Solve the equation 4p + 8 = 12
3) What number is half way between 231 and 234

1E

1) Expand $7(y^2 - z)$

2) Find 3.15 x 600

3) Meg uses $^1/_8$ of a bar of chocolate to make a cake and eats $^1/_3$ of the bar.

   What fraction of the bar is left?

Set 2

2A

1) Simplify $x - 5y + 3x + 5y - 4x$

2) Solve the inequation $5x > 20$

3) Calculate the mean, median, mode and range:
208, 107, 392, 115, 302, 208

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2B

1) List the factors of 24

2) Solve the equation $8x + 1 = 17$

3) Calculate $7\frac{5}{6} + 3\frac{1}{3}$

2C

1) Calculate $3\frac{1}{2} + 4\frac{2}{7} + \frac{1}{28}$

2) Expand $3(2 - 5a)$

3) When the old farmer died, he left his land to his five daughters.

Each daughter had three sons and each daughter gave $^1/_3$ of what she received to each of

her sons. What fraction of the old farmer's land did each boy get?

2D

1) Find $-5 + (-11)$

2) Solve $3x - 12 = 0$

3) Calculate $8\frac{2}{3} - 5\frac{1}{2}$

2E

1) If $x = -2$ and $y = 3$, find the value of $4x^2 - xy$

2) Solve the equation $6x = -36$

3) The mean weight of two chairs is 14kg.

If one of the chairs weighs 15.6kg what is the weight of the other?

Set 3

3A

1) Solve the inequation $2x - 1 \leq 11$
2) Find $450 \div 500$

3) State the highest common factor of $27, 54, 63$

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3B

1) Calculate $3\frac{2}{5} + 1\frac{3}{5}$

2) One less than three times my number is the same as 11.

   What is my number.

3) Copy and fill in the sizes of **all** missing angles.
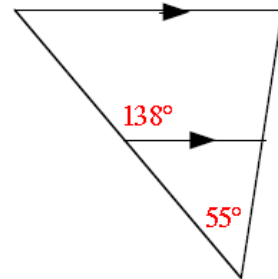
3C

1) If $a = -3$ and $b = 2$ find the value of $4a^2b$

2) Calculate $10\frac{1}{5} - 6\frac{1}{3}$

3) On a numbered 8 sided dice what is P(even)?

3D

1) Expand $2(9p - q)$

2) Calculate $\frac{2}{3} of \left(\frac{1}{4} - \frac{1}{5}\right)$

3) Find 45×76

3E

1) Solve $2(5x + 2) = 35$

2) Calculate $\left(\frac{3}{4} + \frac{1}{7}\right) \times \frac{4}{5}$

3) Change 2hrs 20 mins to minutes.

Set 4

4A

1) Simplify 6 -3(2x – 3y)

2) Calculate $8 \times 2\frac{2}{3}$

3) Copy and fill in all the missing angles

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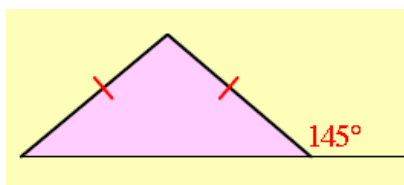
4B

1) Calculate $\frac{1}{6} \times \frac{15}{19}$

2) Simplify -3 – (-8)

3) Calculate the size of the angle marked x in this regular pentagon.
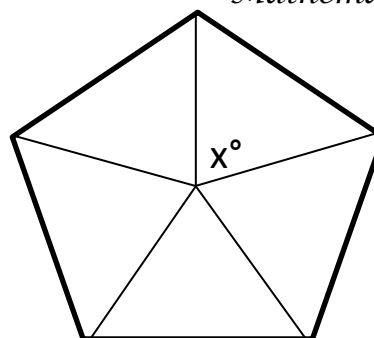
4C

1) Solve 4(x – 2) ≤ 4

2) Calculate 2 x 0·04

3) The mean age of four pupils is 15 years old. If four of the pupil's ages are 13, 16, and 17, then what is the age of the fourth pupil?

4D

1) Write down all the prime numbers between 30 and 40.

2) Calculate $3\frac{1}{2} + 2\frac{3}{4}$

3) On a numbered 8 sided dice what is P(prime)?

4E

1) Expand 12(s² + r)

2) If a = -3 and b = 2 find the value of 3b – 4a

3) Calculate the **mean**, **median**, **mode** and **range**: 11·0, 13·7, 1·7, 8·4, 9·9, 13·7.

Set 5

5A

1) Find 4^2

2) Find 0.605 x 4

3) Write 3.07kg in grams.

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5B

1) Calculate $2\frac{2}{3} + \frac{4}{9} - 3\frac{1}{7}$

2) If a = -3 and b = 2 find the value of $b(a - b)^2$

3) Three guards patrolling a boundary fence pass the check point every 4 minutes, 8 minutes
& 12 minutes respectively. At 9am they all pass the check point together.
At what time will they next pass the check point together?

5C

1) Calculate 0.06 + 4.3 – 2.01

2) On a numbered 8 sided dice what is P(10)?

3) Find $\sqrt{49}$

5D

1) Expand   –w(v + 1)

2) A ten sided dice numbered 1 to 10 is thrown. Find P(square number).

3) Estimate the answer to 2.85 x 5.1

5E

1) Calculate $\frac{5}{8} \times \frac{13}{16}$

2) Calculate 3 x 4 – 2 x 3 x (-4)

3) When a family of 7 visit gran, their mean age if 22. When gran is included in the group, the
mean age of the eight then goes up to 29. How old must gran be?

Set 6

6A

1) Find 40 x 3.61
2) List the factors of 36.
   Circle the ones that are prime.
3) Write 0.4 as a fraction in its lowest terms

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6B

1) Evaluate the expression $2x^2 - 6x$ if $x = -3$

2) Find $-2 - (-7)$

3) Round 0.657198 to 2 decimal places.

6C

1) Calculate $\left(\dfrac{3}{4} - \dfrac{1}{6}\right) \times \dfrac{6}{7}$

2) Expand (13x – 5y)3y

3) Using a scale of **1 cm represents 10m**, find the map length if the real length is 85m.

6D

1) Simplify 4(3x – 2)

2) Calculate the size of the smaller angle between the hands of a clock at 10 past 3.

3) Calculate (-405) ÷ (-9)

6E

1) Find 84 ÷ 400

2) Write $\dfrac{26}{39}$ in its simplest form.
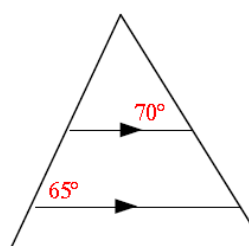
3) Copy and fill in the sizes of **all** missing angles.

Set 7

7A

1) Write 7.15pm in 24 hour notation.

2) The bearing of A from B is 140°. What is the bearing of B from A?

3) Approximate the answer to 386 × 72

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7B

1) Write 00:32 in 12 hour notation.

2) Flooring cost £12.80 / metre. How much would 7 m cost?

3) Today is October 5th. What was the date 3 weeks ago?

7C

1) Solve 6x - 12 = 0

2) Convert 1 week into minutes

3) Copy and fill in all the missing angles
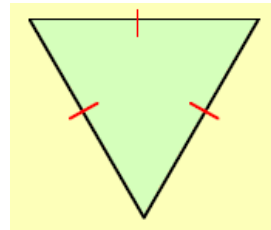
7D

1) Calculate $1\frac{1}{4} + 1\frac{1}{3}$

2) Simplify   -3b^2 + 2b + 4 + b^2 – 2b + 4

3) Sue stands 18m from a house and finds the angle from the ground to the top of the house (angle of elevation) to be 40°. Using a suitable scale, find the height of this building.

7E

1) I think of a number, multiply by 7, subtract 28 and find the result is 0. Find the number.

2) Calculate the size of the angle marked x in this regular hexagon.

3) Solve the inequation 3x + 2 ≥ 20
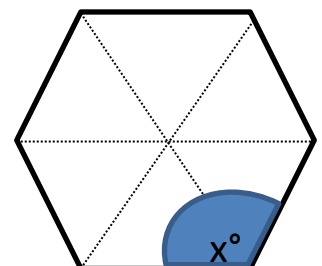
Set 8

8A

1) Expand $(-5d^3 - e^2)e$

2) Change 48 mins to a simplified fraction of an hour.

   Change this to a decimal time in hrs

3) Find an estimate for $\dfrac{19}{1.94}$

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8B

1) Calculate $\left(3\dfrac{3}{4} - 3\dfrac{1}{2}\right)$

2) A film starts at 7.35pm. It lasts 1 hour 45 minutes. When should the film finish.

3) The mean price of two vacuum cleaners is £99.95.

   If one of the vacuums costs £89.55 what must the other one cost?

8C

1) Remove the brackets $4(t - 3)$
2) Using a scale of **1 cm represents 500m**, find the map length if the real length is 2300m.
3) Round the following number to the number of decimal places indicated: 0·00605 (4dp)

8D

1) Calculate $\left(2\dfrac{3}{4} - \dfrac{7}{8}\right)$

2) Solve the inequation $10z - 14 = 16$

3) If I chose a card at random from a pack of cards, what is the probability that it will not be

   a face card?

8E

1) A rectangle has length 2x – 1 cm and breadth 4 cm. Its area is 36cm². Calculate x.
2) Find $^3/_5 \, of \, £85$
3) What 64 x 32

Set 9

9A

1) Calculate $\left(4\dfrac{1}{5} - \dfrac{7}{15}\right)$

2) Simplify 50p : £3
3) Solve the inequation $15 - 4y = 11$

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9B

1) Find 10 – 3 x 2

2) A ship on a bearing of 226° has to turn around and sail in the opposite direction. What would its new bearing be?
3) Copy and fill in the sizes of **all** missing angles.
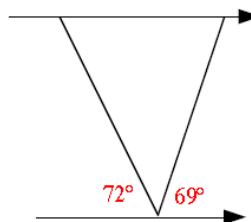
9C

1) Evaluate the expression $4A^3 + B(C - A)$ if A = -3, B = 5 and C = -2
2) Five pizzas cost £27.50. How much will 8 pizzas cost?
3) A life boat sails 16km from harbour on a bearing of 135°, then 20km on a bearing of 075°.

   Make a scale drawing to find the distance and bearing from the life-boat to the harbour.

9D

1) Find 36 ÷ 9 x 4

2) Round the following number to the number of decimal places indicated: 9·8124 (3dp)
3) Make a list of the even prime numbers

9E

1) Find $^{15}/_{33} + 4^1/_5$

2) Find 36 – 4 x 9

3) Write 2.4 hrs in hours and minutes

Set 10

10A

1) It takes 12 workmen 3 hours to repair a roof.
   How long will it take 9 workmen, working at the same rate?
2) Calculate $3\frac{1}{2} + \frac{4}{5}$

3) Find (-5) x (-12)

10B

1) Simplify 3a + 4(a – 7)

2) Using a scale of **1 : 1000,** find the map length if the real length is 86m.
3) What is 4^2 – 3 x 5

10C

1) Calculate $\frac{2}{3} \times \frac{1}{2}$

2) Expand 3(4x + 5)

3) Write down the compass direction North East as a three figure bearing

10D

1) Find 72 ÷ 12
2) Simplify the ratio 1 hour : 35 mins
3) Write the compass direction SOUTH EAST as a bearing.

10E

1) Solve the equation 3(1 – x) = 0

2) Round £7.65179 to 2 decimal places
3) Make a scale drawing and find the height of the plane.

60°   42°

8 km
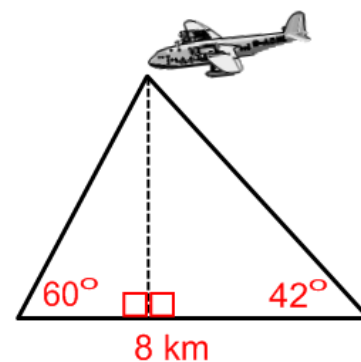
Set 11

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11A

1) Simplify $\frac{40}{48}$

2) Share £72000 in the ratio of 5:1

3) The probability of an event not happening is 0.45.
   What is the probability of the event happening?

11B

1) Calculate $\left(5\frac{1}{2} \times \frac{1}{3} - \frac{1}{3} \right)$

2) Round 0·405784 to 2 decimal places

3) The mean number of chocolates I counted in the first 3 of my Easter Eggs was 18.

   After opening the 4th egg, I discovered that the mean for all 4 was then 22.

   How many chocolates were in that last egg?

11C

1) Solve 3(2x + 7) = 27

2) A life boat sails 16 km SE from harbour, then 20 km on a bearing of 045^0.
   Make a scale drawing to find the distance and bearing of the harbour from the life boat

3) A fish farm has pike and tench in a 4 : 5 ratio.
    If there are 250 tench, how many pike are there?

11D

1) 42 – 3 x 9

2) In 24 hours the Earth turns about its axis through an angle of 360°.
   What angle has it turned through after 15 hours?

3) Find -54 ÷ 3

11E

1) How many days in November?

2) How many hours in November?

3) How many minutes in November?

Set 12

12A

1) How many seconds in November?

2) Calculate 30% of 948

3) The ratio of diesel to petrol cars in a car park is 3 : 5.

   How many petrol cars are there if there are 27 diesel cars?

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12B

1) Convert 750 seconds into minutes and seconds.

2) Copy and fill in the sizes of **all** missing angles.

3) Express $^7/_{10}$ as a decimal
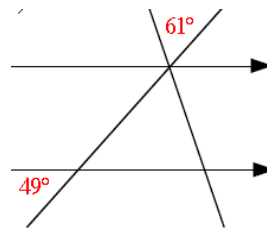
12C

1) Calculate $\left(1\frac{1}{3} + \frac{1}{2} + 1\right)$

2) Simplify $3(2x - y) - 2(y - 3x)$

3) Joe is making a fruit pudding on Scottish Master Chef. In the fruit pudding recipe the ratio of raspberries to blackberries is 5 : 1. Joe's fruit pudding must contain a total of 240 grams of fruit. Calculate the weight of raspberries in his pudding

12D

1) Solve $3(x + 1) = 21$

2) Using a scale of **1 : 100 000**, find the map length if the real length is 6km.

3) Round 0·020487 to 3 decimal places

12E

1) Find $46 + 3 \times 7$

2) Write $1\frac{7}{10}$ hrs in hours and minutes

3) From the top of the Eiffel Tower, Mark sees his friend Jeff on the ground at an angle of depression of 75°. Jeff is 80m from the foot of the tower. Using a scale of 1cm to 20m to make a scale drawing. Find the height of the Eiffel Tower to the nearest metre.

Set 13

13A

1) Calculate $3\frac{1}{4} + 1\frac{4}{9}$

2) Share £112000 in the ratio of 4:3

3) How long is it from 22:45 to 06:27

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13B

1) Simplify $\frac{40}{60}$

2) Covert 0.51 to a percentage

3) Simplify the ratio   5 : 125

13C

1) Using a scale of **1 : 10 000**, find the map length if the real length is 4.2cm.

2) A farmer has enough food to feed 300 cows for 20 days. If he buys 100 more cows, how long would the same amount of feed last?

3) Round 2·987 to 2 decimal places

13D

1) Calculate $9\frac{4}{5} - 3\frac{5}{6}$

2) In his Biology test Brian lost 3 marks, so scored 17 out of 20. In his Maths test he also lost 3 marks, scoring 22 out of 25. Brian thinks he did equally well in both subjects.
Is he correct?

3) Find the total time of 2hrs 45 mins, 1 hr 50 mins, 3 hrs 25 mins, 1 hr 55 mins

13E

1) Solve 5(y - 1) = 35

2) Find 6 × (-50) × (-4)

3) Simplify the ratio 50 : 20

Set 14

14A

1) Simplify $\frac{34}{51}$

2) Convert 1m^2 to cm^2
3) Change 68% to a fraction in its simplest form

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14B

1) Calculate the area of the kite shown in the diagram.
2) A box contains a total of 30 red and blue marbles.
   The probability of picking a red at random is $\frac{2}{5}$.
   How many blue marbles are in the box?
3) Using a scale of **1 cm represents 20km**,
   find the real length if the map length is 7.5cm.

19cm

9cm
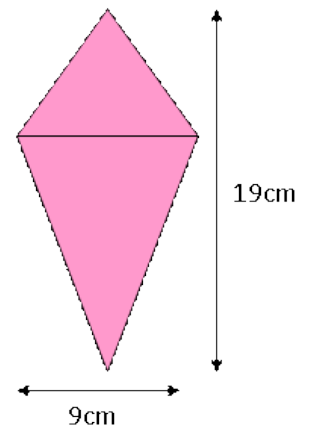
14C

1) 2p – 1 = 2

2) A box of 50 apples costs £6.50. How much would you expect to pay for 12 apples?
3) Covert 0.02 to a percentage

14D

1) Calculate $\left(\dfrac{2}{3}+\dfrac{1}{2}\right)$

2) Covert $^6/_{25}$ to a percentage
3) Bluebell sails 12km on a bearing of 070°, then 16km on a bearing of 160°. By making a scale

   drawing, find how far Bluebell is from its starting point and what bearing it should follow to

   return home.

14E

1) Simplify 75 cm : 2m
2) Calculate the area of the parallelogram shown.

3) What is the sum of the interior angles of an octagon?

9.4cm

8.5cm

13cm
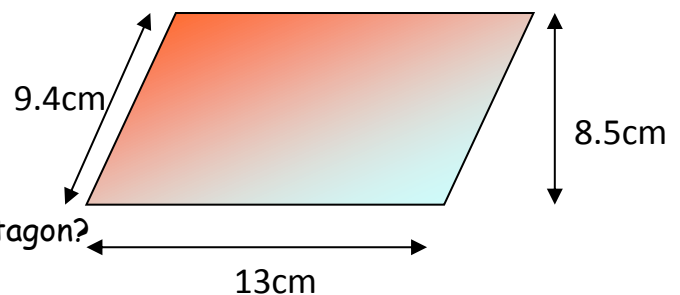
Set 15

15A

1) Find 62.5% of 78m (Hint: 12.5% = $\frac{1}{8}$)

2) Find 6^2 – 3 x 5

3) Copy and fill in the sizes of **all** missing angles.

109°
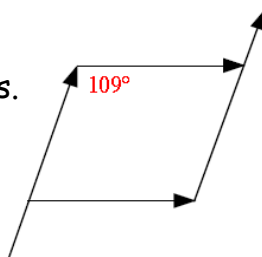
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15B

1) Calculate $3\frac{1}{2} + 4\frac{2}{7} - 1\frac{1}{28}$

2) Convert $2m^2$ to cm^2
3) Polly the parrot was bought for £80 and sold for £90. What is the percentage profit?

15C

1) Write down the first ten square numbers.
2) A class contained 20 pupils. 8 pupils were girls. What % were boys?

3) Calculate the shaded area.

6cm
6cm
15cm
15cm
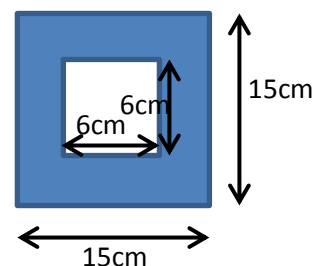
15D

1) If a = -5, b = -1 and c = -2, evaluate $b(a^3 + c^2 - 5ac)$

2) Two dozen chickens have enough feed to last a week. If three of the chickens are removed, how long will the feed last those chickens which are left?
3) Calculate the mean, median, mode and range:

-12, -9, -2, 3, -1, 4, 5, 8, -9, 3

15E

1) Change 16% to a fraction in its simplest form

2) Write the ratio **2 days: 2 weeks** in its simplest form

3) What is the diameter of a circle that has radius 5cm?

Set 16

16A

1) Simplify (-8) – (-8)

2) Calculate 15% of £32
3) Write the compass direction NORTH as a bearing.

16B

1) Share 1 litre in the ratio 3 : 1
2) Convert $1cm^2$ to mm^2
3) Calculate the **shaded area**.

4cm   4cm

4cm

4cm

8cm
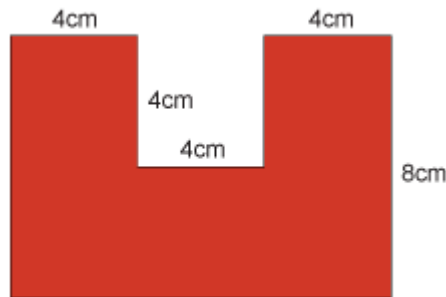
16C

1) Simplify $-x^2(2x^2 - 10x)$

2) Covert $^4/_5$ to a percentage
3) Find -8 x (-8)

16D

1) Find 4 x 2 x 8

2) Using a scale of **1 mm represents 40m**, find the map length if the real length is 9mm.
3) Round 32545 to the nearest thousand

16E

1) Calculate $1\frac{1}{3} + 2\frac{3}{5} - \frac{7}{10}$

2) From a weekly wage of £280, I pay £42 in rent.
   What percentage of my wage goes on rent?

3) Change $2\frac{1}{4}$ litres to cm^3

Set 17

17A

1) Simplify x(x + 7)

2) Find 400% of 41m

3) Calculate $2\frac{1}{3} + \frac{4}{7}$

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17B

1) Simplify   – (-4x) - (-x)

2) Convert 2468cm^2 to m^2

3) A ship sails 8 km on a bearing of 200º and then a further 9 km on a bearing of 100º.

   How far is the ship from its starting point. Scale drawing needed.

17C

1) 16 ÷ (-4)

2) A stack of 360 sheets of paper is 2.4 cm high. How high would a stack of 480 sheets be?

3) Gordon buys an antique teapot for £95. He sells it on an Internet auction site for £133. Calculate his percentage profit.

17D

1) Calculate $\frac{1}{2} \; of \; \frac{4}{5}$

2) Using a scale of **1 : 10 000 000**, find the map length if the real length is 3.9cm.

3) Change 500cm^3 to litres

8cm
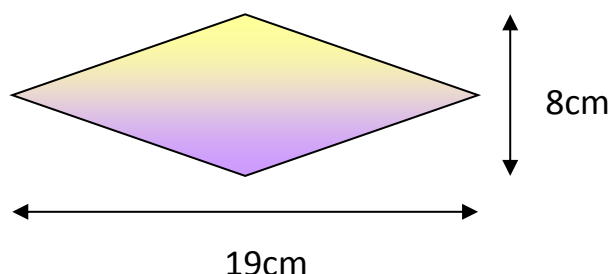
17E

1) Find the area of the shape shown in the diagram.

2) Write the ratio **1 seconds : 1 minute** in its simplest form

3) List the factors of 32. Circle the PRIME factors.

19cm

Set 18

18A

1) Find 0.2 – 0.105

2) Share £45000 in the ratio of 6:4:5

3) Covert $^9/_{20}$ to a percentage

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18B

1) Calculate $1\frac{2}{3} - 1\frac{5}{6} + \frac{1}{2}$

2) A rectangular tank is 2 metres long, 1 metre broad and 0.5 metres deep.
   It is open at the top to collect rain water. How many litres of rain water can it hold?

3) At a school disco there were 12 teachers, 160 boys and 180 girls.

   In simplest form write the ratio of boys : total attended.

18C

1) Find 0.27 x 4

2) Simplify 3x(2x + y)

3) Find 87.5% of 55mm (Hint: 12.5% = $\frac{1}{8}$)

18D

1) Convert 87m^2 to cm^2

2) Write the compass direction NORTH NORTH EAST as a bearing.

3) Write 8.17pm in 24 hour notation

18E

1) Simplify 3(2p + 3q – 4r + 2)

2) How many small boxes of dimensions 8 cm by 12 cm by 6 cm can fit in a larger box of

   dimensions 40cm by 60cm by 18cm.

3) A cuboid has length 10cm and breadth 10cm. It has a volume of 500cm^3. What is the height
   of the cuboid?

Set 19

19A

1) Simplify $m(7m^2 - 10m)$

2) Find the volume of a cuboid that is 3cm by 4cm by 5cm.

3) Find the perimeter of a square with side 4cm.

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19B

1) Eleanor planted 40 sunflower seeds. 5 of the seeds failed to germinate.

   What percentage was this?

2) Convert $5cm^3$ to mm^3

3) A triangle has base 4cm and height 3cm. What is its area?

19C

1) Find the area of a square with side 14cm.

2) Calculate $\frac{7}{10} \times 5\frac{1}{3} \times 1\frac{1}{4}$

3) Walking at 4 km/h a group took 6 hrs 45 minutes to complete their day trek.
   At what speed would they have had to walk to complete it in 6 hours?

19D

1) Find 7 x 0.237

2) Write 23:59 in 12 hour notation

3) A building plot is 60m long by 50m wide. Calculate the area of the plot.

19E

1) How many small boxes of dimensions 5 cm by 4 cm by 9 cm can fit in a larger box of

   dimensions 12cm by 30cm by 18cm.

2) Change 46% to a fraction in its simplest form

3) Copy and fill in the sizes of **all** missing angles.
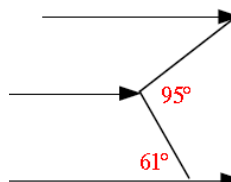
Set 20

20A

1) Solve the inequation $3(1 - t) \leq 0$

2) Share £5 in the ratio 7 : 13
3) Find 25% of 180

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20B

1) Calculate $3\frac{1}{2} + 1\frac{4}{7} - 2\frac{1}{4}$

2) Change $62^{1}/_{2}\%$ to a fraction in its simplest form (Hint: $12\frac{1}{2}\%$ is $\frac{1}{8}$)

3) Calculate the **shaded area**.

12m

4m

9m

5m
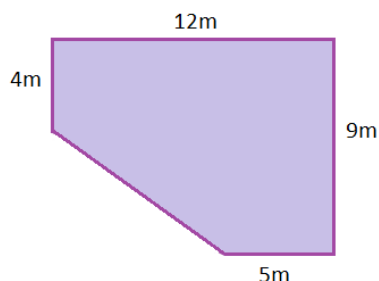
20C

1) Write 3am in 24 hour notation.

2) Convert $9000mm^3$ to cm^3
3) A farmer uses 60 metres of fencing to form a rectangular pen in a field.
   Given that the pen has breadth 7 metres, find the width of the pen.

7m
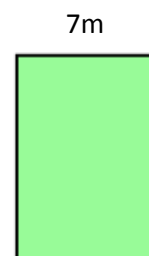
20D

1) How many small boxes of dimensions 3 cm by 5 cm by 6 cm can fit in a larger box of

   dimensions 30 cm by 24 cm by 8 cm.

2) Simplify $5(2a + 3b - 4c + 2) + 3(3a - 2b + c + 3)$

3) Find $4.8 \div 20$

20E

1) Calculate $\left(\frac{3}{5} \times \frac{2}{3} - \frac{3}{10}\right)$

2) Simplify $14 - 3(x - 4y) - (y - 5 + 8x)$

3) A banquet costs £$(75 + 15n)$, where n is the number of people attending.
   Calculate the **total** cost of the banquet if 84 people attend.

Set 21

21A

1) Write $\frac{3}{5}$ as a decimal

2) Covert $^7/_{50}$ to a percentage
3) Convert $8m^3$ to cm^3

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21B

1) Simplify $9 – 4(2x – 3) – 2(x + 5)$

2) Find $57 – 3 \times 9$

3) Calculate the length of the diagonal of the rhombus. **Area = 36cm² (Hint: multiply the lengths of the two diagonals and divide by 2 to get the area of a rhombus)**

6cm
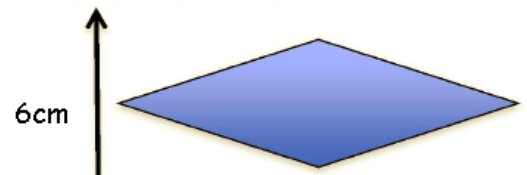
21C

1) Evaluate $3m^2 + 2n$ when m = -4 and n = -1

2) An 80 g packet of crisps contains 520 Kilojoules of energy.
   If a bag of crisps has 325 Kilojoules of energy, what weight would you expect it to be?
3) A shop reduced its prices by 13%.
   What is the sale price of a coat originally priced at £85?

21D

1) Calculate $\frac{2}{3} + 1\frac{3}{7}$

2) Calculate the surface area of a cube of side 3cm.
3) In a game a player scores 4 points for each correct answer and pays penalty points for

   each wrong answer. One player got 30 correct answers out of 90 questions and ended up

   with a total of -60 points.

   How many points are given for a wrong answer.

21E

1) How many spheres of radius 4cm can fit into a box with dimensions 32 cm by 24cm by 40cm
2) Write down a formula for the next three numbers in this sequence: 2, 7, 12, 17, 22 …

3) A farmer uses 60 metres of fencing to form two congruent rectangular pens side by side in

   a field as shown. Given that the pen has breadth 12 metres, find the length of ONE

   rectangle.

   12m

Set 22
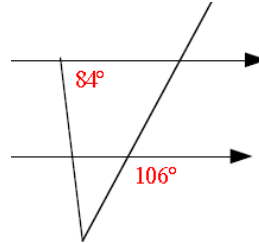
22A

1) Copy and fill in the sizes of **all** missing angles.
2) If x = -1, y =-4 and z = 2, evaluate x + y + z

3) The square has side 4cm long, and each triangle has altitude 4cm.
   Find the area of this composite
   shape .

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22B
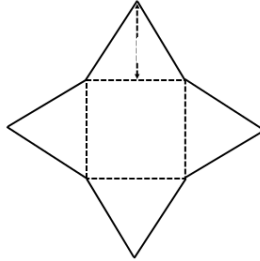
1) Calculate $\frac{2}{7}$ x $2\frac{4}{5}$ $x\frac{1}{4}$

2) Simplify 7(2x + 3y – z + 5) – 5(3x – 2y + z – 4)

3) Which subject did Lauren do best in: Maths $^{18}/_{24}$, English $^{51}/_{75}$, History $^{42}/_{60}$, Art $^{28}/_{35}$

22C

1) A triangle has a base twice its height. The area of the triangle is 36m^2.

   Find the base length and height of the triangle.

2) A box has dimension 12cm x 30cm x 48cm. How many cylindrical cans of radius 3cm and height 12cm can it hold?

3) Calculate the area of a circle with radius 4cm.

22D

1) Simplify $\frac{42}{84}$

2) Three steel nails are shown. The lengths of the nails are in the ratio 1 : 3 : 5.
   The length of the middle nail is 7·5 centimetres. Calculate the length of the large nail.

3) The final speed of a car is *v* and can be calculated using the formula *v* = *u* + *at* where *u* is the initial speed, *a* is the acceleration and *t* is the time taken.
   Find *v* if the acceleration is 2 m/s, the time taken is 10s and the initial speed is 4 m/s.

22E

1) Calculate the perimeter of a circle with radius 4cm.

2) Find $66^2/_3$% of 180miles

3) The surface area of a cube is 150cm^2. Calculate the length of one edge of the cube.

Set 23

23A

1) Calculate $\left(3\frac{1}{2} \times \frac{3}{4}\right)$

2) Covert 1.3 to a percentage
3) Calculate the area of a circle with diameter 5cm.

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23B

1) If x = -1, y =-4, evaluate 2x – 3y

2) The supply of cornflakes at the scout camp was enough to last 20 scouts for 6 days.
   If 4 more scouts go to camp how many days will the cornflakes last?
3) Write down the order of rotational symmetry for these shape:
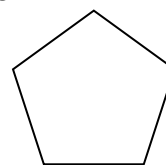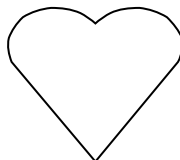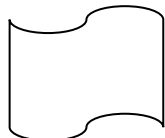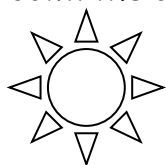
23C

1) Simplify $\frac{48}{64}$

2) Write down the next 3 terms of this sequence -4, -1, 2, 5, 8 …
3) Calculate the area of a circle with radius 7cm.

23D

1) Simplify 11 – 9(3r – 4s – 2)
2) Calculate the circumference of a circle with diameter 7cm.
3) Calculate the volume of a cuboid that is 7cm by 2cm by 3cm.

23E

1) Gladys bought a picture for £150 and later sold it for £220.
   Calculate her percentage profit correct to 1 decimal place.
2) Write the compass direction NORTH EAST EAST as a bearing.

3) A dealer bought 120 carpets which had been damaged by fire and paid an average of

   £12.50 each for them. Fifteen were too badly damaged to sell but he sold the rest at a

   price which gave him 40% profit on this total outlay. What was his average selling price per

   carpet?

Set 24

24A

1) Calculate $3\frac{1}{2} - 1\frac{3}{5}$

2) Make a formula for the surface area of this cube.
3) Solve the equation 3 = 6(1 – x)

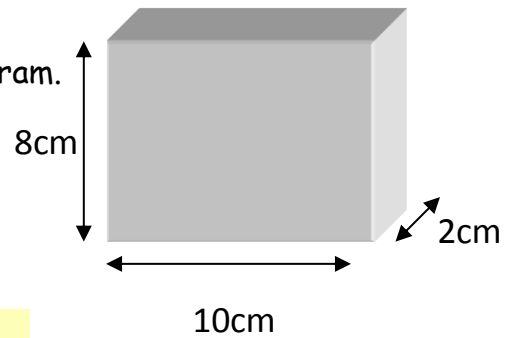x cm
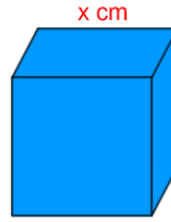
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24B
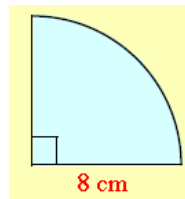
1) Simplify $(7p)^2 \times (-p)^2$

2) Covert $^5/_8$ to a percentage

3) Calculate the volume of the cuboid shown in the diagram.

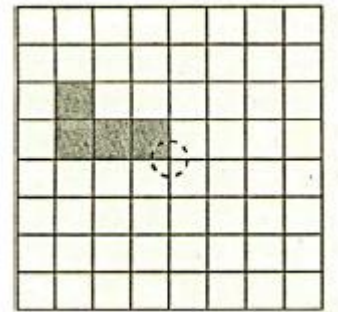*Mathematics Department*

8cm

2cm

10cm

24C

1) Calculate the perimeter of this shape.

8 cm

2) An 80 g packet of crisps contains 520 Kilojoules of energy.
   How much energy would you expect in a 200g Family bag of crisps?
3) Copy and complete to give the shape rotational symmetry of order 2:

24D

1) If x = -1, y =-4 and z = 2, evaluate $(y - x)^z$

2) Find the mean, median, mode and range:

   10, $5\frac{1}{2}$, $2\frac{1}{2}$, $4\frac{1}{2}$, $5\frac{1}{2}$, $2\frac{1}{2}$, $5\frac{1}{2}$, 4

3) Circular discs of radius 3.5cm are cut from a rectangular sheet of cardboard
   measuring 50cm by 30cm. This diagram is not drawn to scale! Calculate the area of cardboard
   wasted.
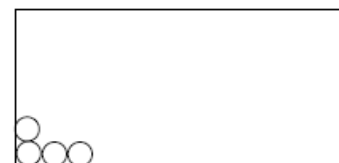
24E

1) Calculate $\left(\frac{3}{5} + \frac{1}{5} + \frac{2}{10}\right) \times \frac{3}{4}$

2) Find $33^1/_3$% of 117kg
3) Three consecutive numbers are to be added together.
   (a) If x is the smallest number, what are the other two?
   (b) Write down a formula for the total, T, of the three numbers, using your answer to (a).
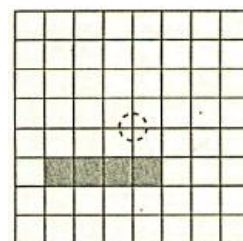
Set 25

25A

1) Simplify $\frac{24}{45}$

2) Find 15% of £85

3) Draw a coordinate diagram and plot the following points:
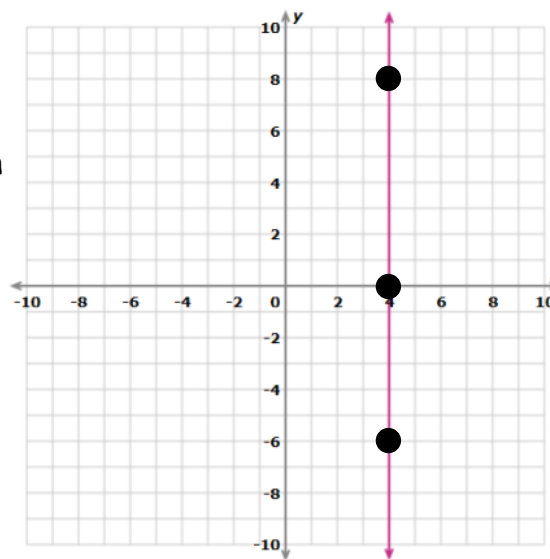
   A(0, -3), B(4, 6), C(0, 9), D(-4, 6)

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25B

1) Simplify $8g - (2 - g)g$

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2) Write down a formula for the nth term of this sequence: $1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \ldots$

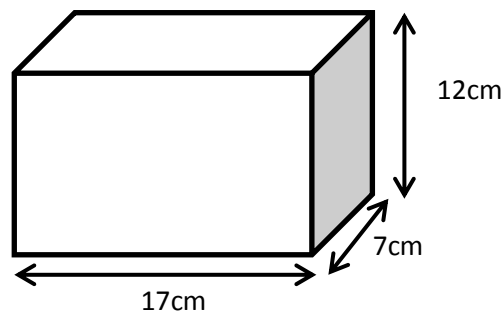3) Copy and complete to give the shape rotational symmetry of order 4:

25C

1) If $x = -1$, $y = -4$ and $z = 2$, evaluate $xy + 2yz$

2) Change 85% to a fraction in its simplest form

3) Write down the coordinates of the 3 points shown

25D

1) Calculate $\left(\frac{1}{2} \times \frac{1}{2}\right)$

2) How many spheres of radius 7cm can fit into a box with dimensions 21cm by 30cm by 35cm

3) Find total surface area of the shape shown.

12cm

7cm

17cm

25E

1) Find $0.612 \div 30$

2) A boy takes 150 steps to cover a distance of 120 m.
   How far would he walk after 250 steps?

3) Plot the following points:
   (-3, -9), (-2, -6), (-1, -3), (0, 0), (1, 3), (2, 6), (3, 9)

Set 26

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26A

1) Write in words: 106 040

2) Find the sum of 9827, 369 and 40 127

3) Calculate 3794 ÷ 7

26B

1) Calculate 4.37 x 20
2) Calculate 4320 ÷ 30
3) How many cylinders of height 10cm and diameter 4cm fit into a box with dimensions of

   20cm by 48cm by 12cm?

26C

1) List the factors of 25.
2) Change 35% to a fraction in its simplest form
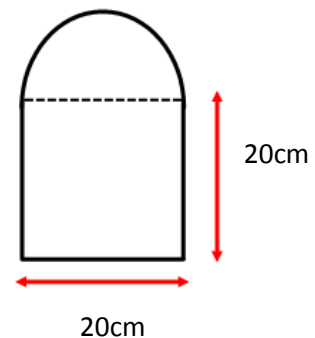3) Calculate $\left(1\frac{2}{3}+\frac{1}{2}\right)$.

26D

1) Change 140% to a fraction in its simplest form

2) Copy and complete to give the shape rotational symmetry of order 2:

3) Make a formula for the surface of this cuboid.

c cm

b cm

a cm
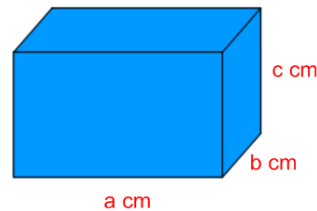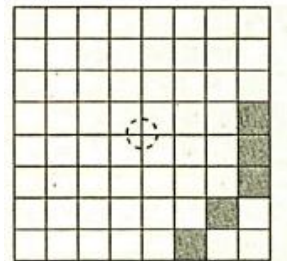
26E

1) Find the lowest common multiple of 6, 7 and 9.
2) Find 0.432 x 70
3) This shape is constructed from a semi-circle and square.
   Calculate the i) perimeter and ii) area of this shape:

20cm

20cm

Set 27

27A

1) Calculate the value of a°

2) Find 12 – 4 x 2 + 3

3) Calculate the perimeter of this shape:

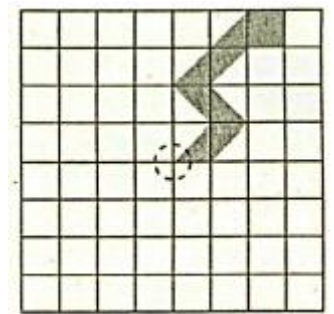*Fortrose Academy*

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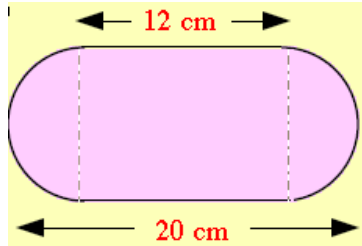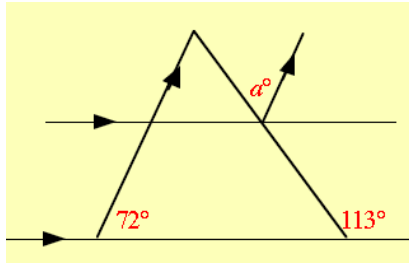
27B

1) Calculate $1\frac{1}{3} - 2\frac{1}{5}$

2) Simplify the ratio $4\frac{1}{2} : 6\frac{3}{4}$

3) Calculate 97 – 0.08

27C

1) Change 35% to a fraction in its simplest form

2) Calculate 3.21 – 1.8597

3) Tickets for a school concert are sold at £3 for adults and £2 for children.
   (a) If p adults and q children buy tickets, write a formula for the total value, T, of the ticket sales.
   (b) Find the total value of the ticket sales if p = 50 and q = 20.

27D

1) Simplify r(s + 1) – s(r + 2) + 2(r + s)

2) Copy and complete to give the shape rotational symmetry of order 4:

3) Calculate $5\frac{2}{3} + 1\frac{3}{7}$

27E

1) How many cylinders of height 9cm and diameter 5cm

   fit into a box with dimensions of 27cm by 30cm by 16cm ?

2) Find 37.5% of 26kg (Hint: 12 ½ % is 1/8)

3) Find $\sqrt{121}$

Set 28

28A

1) Calculate $2\frac{1}{3} + \frac{5}{6}$

2) Change $12^1/_2\%$ to a fraction in its simplest form

3) The formula to convert temperatures from degrees Fahrenheit (°F)
   into degrees Celsius (°C) is $C = {}^5/_9(F - 32)$
   Calculate the temperature in °C which is equivalent to a temperature of -7 °F .
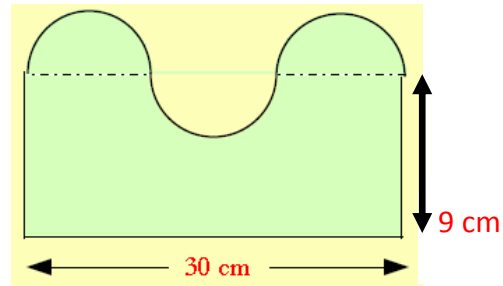
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28B

1) Simplify 7b – (b – 2)b

2) The distance travelled, *s* metres, by a car is given by $s = ut + {}^1/_2ft^2$.
   Here *u* is the car's initial speed (in m/s), *t* the time (in seconds) and *f* the acceleration (in m/s^2).
   Find *s* when *u* = 50, *t* = 4, *f* = - 5

3) Calculate the perimeter of this shape

9 cm

30 cm

28C

1) Calculate $2\frac{1}{2} \ x \ 1\frac{3}{4} - \ 2\frac{1}{3}$

2) Covert $^3/_{11}$ to a percentage

3) Calculate the area of a circle with diameter 17cm.

28D

1) Calculate 8 – 12 ÷ 3 + 4

2) Change 25% to a fraction in its simplest form

3) A rectangular box measuring 12cm x 4cm x 4 cm contains golf ball of diameter 4cm.

   How many balls are in a box.

28E

1) Find 43% of £65 000.
2) Calculate 864 ÷ 4000
3) Simplify the ratio 1.5g : 250 mg