

S2 Homework Set (11)

Set (11A)

$$\begin{aligned} \textcircled{1} \quad & ab + a^2b - 9ab + 5a^2b + b^2a \\ & = -8ab + 6a^2b + b^2a \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad & \text{number of parts} = 6 \\ & \text{one part} = 72000 \div 6 \\ & = 12000 \end{aligned}$$

$$\begin{aligned} & 5 \text{ parts} \\ & 5 \times 12000 \\ & = \underline{\underline{60000}} \end{aligned}$$

$$\begin{aligned} & 1 \text{ part} \\ & \underline{\underline{12000}} \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad & P(\text{event happening}) = 1 - 0.45 \\ & = 0.55 \end{aligned}$$

Set (11B)

$$\begin{aligned} \textcircled{1} \quad & \left(5\frac{1}{2} \times \frac{1}{3} - \frac{1}{3} \right) \div \frac{9}{8} \\ & = \left(\frac{11}{2} \times \frac{1}{3} - \frac{1}{3} \right) \div \frac{9}{8} \\ & = \left(\frac{11}{6} - \frac{2}{6} \right) \div \frac{9}{8} \\ & = \frac{9}{6} \times \frac{8}{9} \\ & = \frac{4}{3} \\ & = 1\frac{1}{3} \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad & 0.405784 \\ & = 0.4058 \quad (4 \text{ s.f.}) \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad & \text{total for 3 eggs} \quad 3 \times 18 \\ & = 54 \end{aligned}$$

$$\begin{aligned} \text{total for 4 eggs} &= 4 \times 22 \\ &= 88 \end{aligned}$$

$$\begin{aligned} \text{number of chocolates in last egg} &= 88 - 54 \\ &= 34 \end{aligned}$$

Set (110)

$$\textcircled{1} \quad 3(2x+7) = 2(5x-3)$$

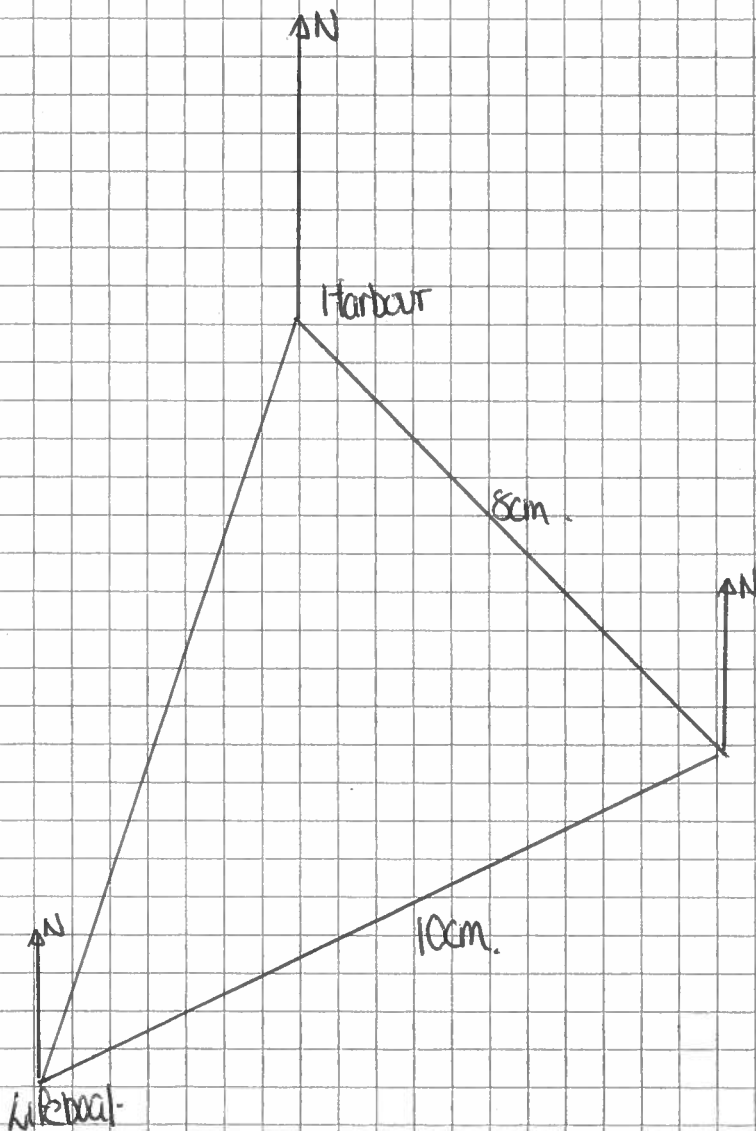
$$6x+21 = 10x-6$$

$$21 = 4x - 6$$

$$27 = 4x$$

$$x = \frac{27}{4}$$

② Scale 1cm to 2km



$$\begin{aligned} \text{bearing } 019^\circ \\ \text{distance } 10.6 \times 2 \\ = 21.2 \text{ km} \end{aligned}$$

(3) pike tench

$$\begin{array}{ccc} & 4 & 5 \\ \times 50 \swarrow & & \searrow \times 50 \\ 200 & & 250 \end{array}$$

There are 200 pike.

Set (II)

(1) $-8t^3(u-tu)$
 $= -8t^3u + 8t^4u$

(2) 1 hour $\frac{360^\circ}{24}$ or hours angle.

$$\begin{array}{ccc} & 360^\circ & \\ \frac{360}{24} & & \\ 15 \text{ hours} & \frac{360}{24} \times 15 & \\ & \frac{360}{24} & \\ & 21 & \\ & = 225^\circ & \end{array}$$

$$\begin{array}{ccc} & 24 & 360 \\ \div 8 & \swarrow & \searrow \div 8 \\ & 3 & 45 \\ \times 5 & \swarrow & \searrow \times 5 \\ & 15 & 225^\circ \end{array}$$

(3) $80 \times 24 \times 60 \times 60$
 $720 \times 60 \times 60$
 $= 6320 \times 60$
 $= 259200 \text{ seconds.}$

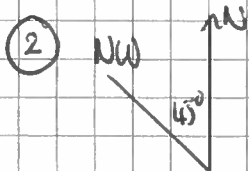
$$\begin{array}{r} 72 \\ \times 6 \\ \hline 432 \end{array}$$

$$\begin{array}{r} 632 \\ \times 6 \\ \hline 2592 \end{array}$$

Set (II)

(1) $(-0.54) \div 0.3$
 $= -5.4 \div 3$
 $= -1.8$

$$\begin{array}{r} 4.8 \\ 3 \overline{) 15.4} \end{array}$$



bearing $360 - 45$
 $= 315^\circ$

(3) $32.4 - 0.6 - 0.6$
 $= 31.2 \text{ mm.}$

S2 Homework Set (12)

Set (12A)

① $2(x+3) = 8-3(x-4)$
 $2x+6 = 8-3x+12$
 $2x+6 = 20-3x$
 $5x+6 = 20$
 $5x = 14$
 $x = \frac{14}{5}$

② 1% of 948 = 9.48
 3% of 948 = 3×9.48
 = 28.44

$$\begin{array}{r} 9.48 \\ \times 3 \\ \hline 28.44 \end{array}$$

③

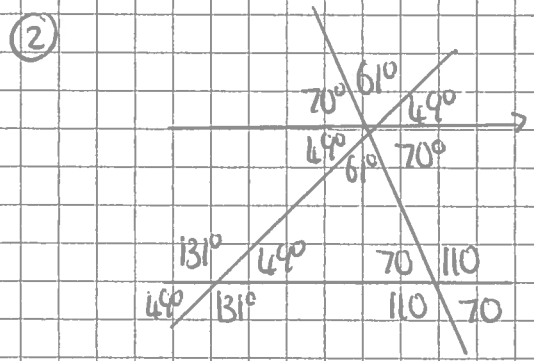
	<u>diesel</u>	<u>petrol</u>
x 9	3	5
	27	45

45 petrol cars

Set (12B)

① 750 secs.
 = 12 mins 30 seconds

$$\begin{array}{r} 60 \\ \times 12 \\ \hline 720 \end{array}$$



$$\begin{aligned} 69 + 61 &= 110^\circ \\ 180 - 110 &= 70^\circ \end{aligned}$$

③ $9 \overline{) 0.777}$
 $9 \overline{) 7.7000}$

$$\frac{7}{9} = 0.777... = 0.\overset{\circ}{7}$$

Set (12c)

①

$$\begin{aligned} & \left(1\frac{1}{3} + \frac{1}{2} + 1 \right) \times \frac{3}{11} \\ &= \left(2\frac{2}{6} + \frac{3}{6} \right) \times \frac{3}{11} \\ &= 2\frac{5}{6} \times \frac{3}{11} \\ &= \frac{17}{6} \times \frac{3}{11} \\ &= \frac{17}{22} \end{aligned}$$

②

$$\begin{aligned} & 3(2x - y) - 2(y - 3x) \\ &= 6x - 3y - 2y + 6x \\ &= 12x - 5y \end{aligned}$$

③

number of parts = 6

$$\text{one part} = 240 \div 6$$

$$= 40g$$

$$\begin{aligned} \text{weight of raspberries} & 5 \times 40 \\ &= 200g \end{aligned}$$

Set (12d)

①

$$\text{Solve } 2(3(x+1) - 8) = 20$$

$$6(x+1) - 16 = 20$$

$$6x + 6 - 16 = 20$$

$$6x - 10 = 20$$

$$6x = 30$$

$$x = 5$$

②

$$1 : 100\,000$$

$$\text{map length } 6 \text{ km} \div 100\,000$$

$$= 6000 \text{ m} \div 100\,000$$

$$= 600000 + 100000$$

$$= 60m$$

③ 0.020487
 $= 0.020$ (2 s.f.)

Set (2E)

① $4x^2 - 8y^2 - 3xy + 5xy - 2y$
 $= 4x^2 - 10y^2 + 2xy$

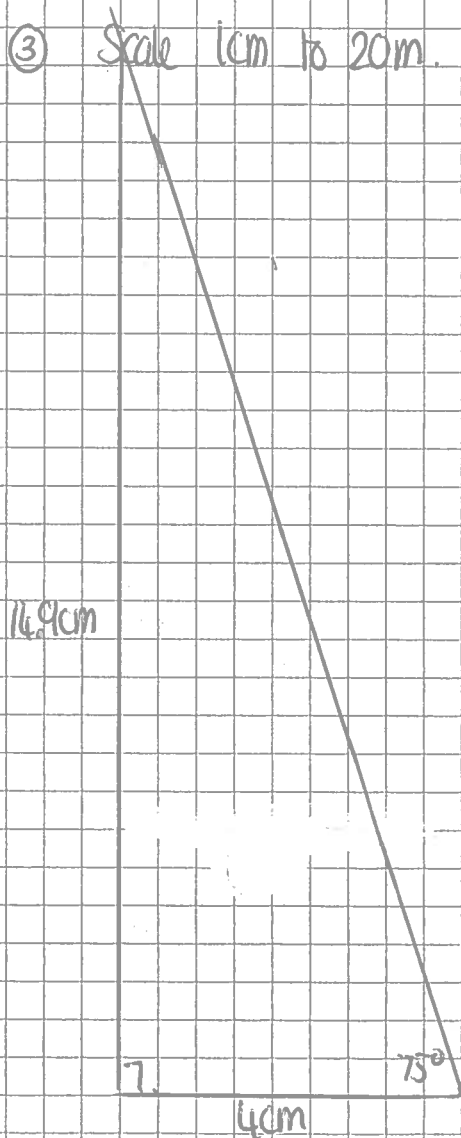
② $1 \frac{7}{8}$ hr
 $= 1$ hr 52.5 mins.

$$\frac{7}{8} \times 60$$

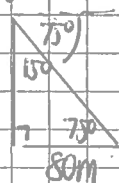
$$= \frac{105}{2}$$

$$= 52.5$$

③ Scale 1cm to 20m.



Rough sketch



real height = 14.9×20
 $= 298m$

S2 Homework Set (B)

Set (BA)

$$\begin{aligned}
 \textcircled{1} \quad 9\frac{1}{4} & \div \left(17\frac{1}{2} \text{ of } 10\frac{4}{7}\right) \\
 & = 9\frac{1}{4} \div \left(\frac{34}{2} \times \frac{37}{7}\right) \\
 & = \frac{37}{4} \div 185 \\
 & = \frac{37}{4} \times \frac{1}{185} \\
 & = \frac{1}{20}
 \end{aligned}$$

$$\begin{aligned}
 \textcircled{2} \quad \text{number of parts} & = 4+3 \\
 & = 7 \\
 \text{one part} & = 112000 \div 7 \\
 & = £16000
 \end{aligned}$$

$$\begin{aligned}
 4 \text{ parts} & = 4 \times 16000 \\
 & = 64000
 \end{aligned}$$

$$\begin{aligned}
 3 \text{ parts} & = 3 \times 16000 \\
 & = 48000
 \end{aligned}$$

$$\textcircled{3} \quad 22:45 \xrightarrow{15 \text{ mins}} 23:00 \xrightarrow{1 \text{ hr}} \text{midnight} \xrightarrow{6 \text{ hr } 27 \text{ mins}} 06:27$$

total 7hrs 42minutes.

Set (BB)

$$\begin{aligned}
 \textcircled{1} \quad 10 + 4(x-2y) - 2(2y-3+3x) \\
 & = 10 + 4x - 8y - 4y + 6 - 6x \\
 & = 16 - 2x - 12y
 \end{aligned}$$

$$\textcircled{2} \quad 0.409 = 40.9\%$$

$$\begin{array}{l} \textcircled{3} \quad 0.5 : 1.25 \\ \qquad \qquad \qquad \downarrow \times 4 \\ \qquad \qquad \qquad 2 : 5 \end{array}$$

Set (BC)

$$\textcircled{1} \quad 1 : 10\,000$$

$$\begin{aligned} \text{real map length} &= 4.2 \times 10\,000 \\ &= 42\,000 \text{ cm} \\ &= 420 \text{ m} \\ &= 0.42 \text{ km} \end{aligned}$$

$$\begin{array}{l} \textcircled{2} \quad \begin{array}{ll} \text{cows} & \text{days} \\ 300 & 20 \\ 1 & 6\,000 \\ 400 & 15 \end{array} \end{array}$$

$\downarrow \times 300$
 $\downarrow \div 400$

15 days.

$$\begin{array}{l} \textcircled{3} \quad 2.967 \\ \qquad \qquad = 3.0 \quad (2 \text{ s.f.}) \end{array}$$

Set (BD)

$$\begin{aligned} \textcircled{1} \quad 9 \frac{4}{5} - 3 \frac{5}{6} \\ &= 6 \frac{4}{5} - \frac{5}{6} \\ &= 6 \frac{24}{30} - \frac{25}{30} \\ &= 5 \frac{54}{30} - \frac{25}{30} \\ &= 5 \frac{29}{30} \end{aligned}$$

$$\textcircled{2} \quad \begin{array}{l} \text{Biology} \quad \frac{17}{20} = \frac{85}{100} = 85\% \\ \text{Maths} \quad \frac{22}{25} = \frac{88}{100} = 88\% \end{array}$$

He did better in Maths.

$$\textcircled{3} \quad 2.987 \\ = 3.0 \quad (2 \text{ sf})$$

Set BE

$$\textcircled{1} \quad 3(5(y-1)+2) = 36$$

$$3(5y-5+2) = 36$$

$$3(5y-3) = 36$$

$$15y-9 = 36$$

$$15y = 45$$

$$y = 3.$$

$$\textcircled{2} \quad 0.6 \times (-500) \times (-0.4) \\ = 120$$

$$6 \times 5 \times 4 \\ = 120$$

$$\textcircled{3} \quad \left. \begin{array}{l} 2\frac{1}{2} : \frac{3}{5} \\ 25 : 6 \end{array} \right\} \times 10.$$

S2 Homework Set 14

level 3/4

Set 14A

$$\begin{aligned} \textcircled{1} \quad & -9t(st - 5t^2) \\ & = -9st^2 + 45t^3 \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad & 9\text{m}^2 \\ & = 9 \times 100 \times 100 \text{ cm}^2 \\ & = 90\,000 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad 68\% &= \frac{68}{100} \\ &= \frac{17}{25} \end{aligned}$$

Set 14B

$$\begin{aligned} \textcircled{1} \quad \text{Area} &= \frac{1}{2} \times \text{diagonal} \times \text{diagonal} \\ &= \frac{1}{2} \times 9 \times 19 \\ &= 85.5 \text{ cm}^2 \end{aligned}$$

$$\begin{array}{r} 19 \\ \times 9 \\ \hline 171 \\ 85.5 \\ \hline 21171.0 \end{array}$$

$$\begin{aligned} \textcircled{2} \quad & \text{blue } 60\% \\ & 10\% \rightarrow 3 \text{ of } 30 \\ & 60\% = 6 \times 3 \\ & = \underline{\underline{18}} \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad \text{real length} &= 20 \times 7.5 \\ &= 150 \text{ km} \end{aligned}$$

Set 14C

$$\begin{aligned} \textcircled{1} \quad & 3(2(2p-1)-5)-1=2 \\ & 3(4p-2-5)-1=2 \\ & 3(4p-7)-1=2 \\ & 12p-21-1=2 \end{aligned}$$

$$12p - 22 = 2$$

$$12p = 24$$

$$p = 2$$

(2)

apples

cost

50

6.50

0.13

12

1.56

$$\begin{array}{r} 13 \\ \times 12 \\ \hline 26 \\ 130 \\ \hline 156 \end{array}$$

£1.56 per 12 apples.

(3)

0.026

= 2.6%

Set (41)

(1)

$$\left(\frac{2}{3} + \frac{1}{2} \div 2 \right) \times \frac{3}{5}$$

$$= \left(\frac{2}{3} + \frac{1 \times 1}{2 \times 2} \right) \times \frac{3}{5}$$

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

$$= \left(\frac{8}{12} + \frac{3}{12} \right) \times \frac{3}{5}$$

$$= \frac{11}{12} \times \frac{3}{5}$$

$$= \frac{11}{20}$$

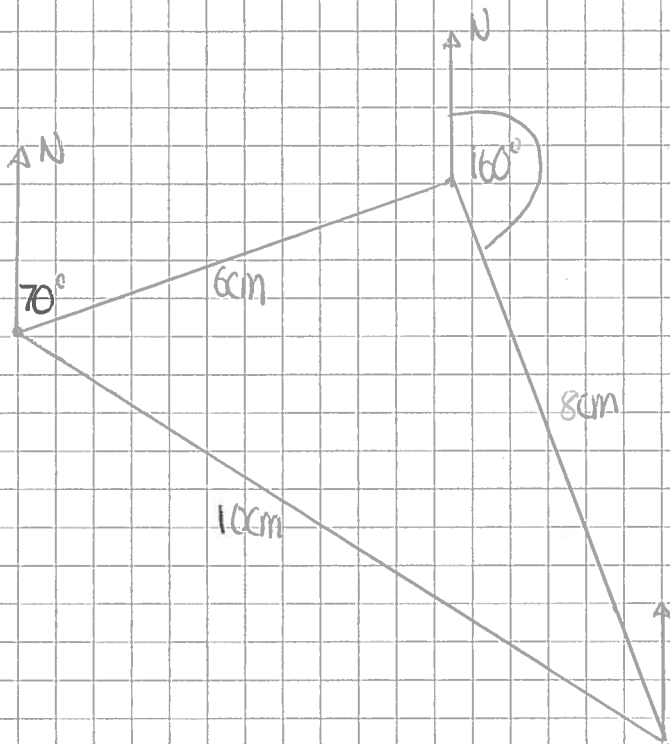
(2)

$\frac{6}{25}$

$$= \frac{24}{100}$$

= 24%

③ Scale 1cm : 2km



distance home 10cm

$$\text{real distance} = 2 \times 10 \\ = 20\text{km}$$

bearing 302°

Self 4E

①

$$75\text{cm} : 2\text{m}$$

$$75\text{cm} : 200\text{cm}$$

$$75 : 200$$

$$3 : 8$$

②

$$A = bh$$

$$= 13 \times 8.5$$

$$= 110.5\text{cm}^2$$

$$\begin{array}{r} 8.5 \\ \times 13 \\ \hline 255 \\ 850 \\ \hline 110.5 \end{array}$$

③

$$180 \times 6$$

$$= 1080^\circ$$

52 Homework Set 15

Set 15A

① 62.5% of 78m.

10% → 7.8

50% → 46.8

5% → 3.9

2.2% → 1.95

62.2% → 46.8 + 1.95

 = 48.75m.

or 62.5% of 78m

= $\frac{5}{8}$ of 78

= $78 \div 8 \times 5$

= 48.75m.

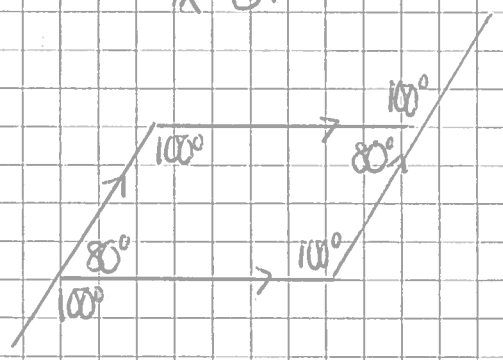
② $x(x+4) = x^2 + 12$

$x^2 + 4x = x^2 + 12$

$4x = 12$

$x = 3.$

③



Set 15B

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

= $6\frac{1}{2} + \frac{2}{7} - \frac{1}{28}$

= $6\frac{14}{28} + \frac{8}{28} - \frac{1}{28}$

= $6\frac{21}{28}$

= $6\frac{3}{4}$

$$\begin{aligned} \textcircled{2} \quad & 2\text{cm}^2 \\ & = 2 \div 100 \div 100 \text{ m}^2 \\ & = 0.0002 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad & \text{profit} = 10 \\ & \% \text{ profit} = \frac{10}{80} \times 100 \\ & = \frac{1}{8} \times 100 \\ & = 12.5\% \end{aligned}$$

Set 15C.

$$\begin{aligned} \textcircled{1} \quad & 5\text{cm} : 200\text{km} \\ & 1\text{cm} : 40\text{km} \\ & 1\text{cm} : 40000\text{cm} \\ & 1 : 40000 \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad & 12 \text{ boys} \\ & \% \text{ boys} = \frac{12}{20} \times 100\% \\ & = 60\% \end{aligned}$$

$\begin{aligned} \textcircled{3} \quad & \text{Large circle} \\ & A = \pi r^2 \\ & = \pi \times 7.5^2 \\ & = 176.7146 \text{ cm}^2 \end{aligned}$	$\begin{aligned} & \text{Small circle} \\ & A = \pi r^2 \\ & = \pi \times 3.5^2 \\ & = 38.4845 \text{ cm}^2 \end{aligned}$	$\begin{aligned} & r = \frac{1}{2}(15-8) \\ & = 3.5 \\ & \text{(4 d.p.)} \end{aligned}$
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$$\begin{aligned} \text{shaded area} & = 176.7146 - 38.4845 \\ & = 138.2301 \\ & = 138 \text{ cm}^2 \quad (3 \text{ s.f.}) \end{aligned}$$

Set 15D

$$\begin{aligned} \textcircled{1} \quad & b(a^3 + c^2 - 5ac) \\ & = (-1)((-5)^3 + (-2)^2 - 5 \times (-5) \times (-2)) \\ & = (-1)(-125 + 4 - 50) \\ & = (-1) \times (-171) \\ & = 171 \end{aligned}$$

	chickens	days	
	24	7	↓ × 8
÷ 8 ↓	3	56	↓ ÷ 7
× 7 ↓	21	8	

8 days.

$$\begin{aligned} \textcircled{3} \quad \text{mean} &= \frac{(-12) + (-9) + (-2) + 3 + (-1) + 4 + 5 + 8 + (-9) + 3}{10} \\ &= \frac{-10}{10} \\ &= -1 \end{aligned}$$

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

median = 1

mode: -9 and 3.

$$\begin{aligned} \text{range} &= 8 - (-12) \\ &= 20. \end{aligned}$$

Set 15E

$$\begin{aligned} \textcircled{1} \quad 16\% &= \frac{16}{100} \\ &= \frac{4}{25} \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad d &= \frac{C}{\pi} \\ &= \frac{1}{\pi} \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad 2 \text{ days} &: 2 \text{ weeks.} \\ \frac{2}{1} &= \frac{14}{7} \end{aligned}$$

$$\begin{aligned} &= 0.318 \text{ m (3 s.f.)} \\ &= 31.8 \text{ cm} \end{aligned}$$