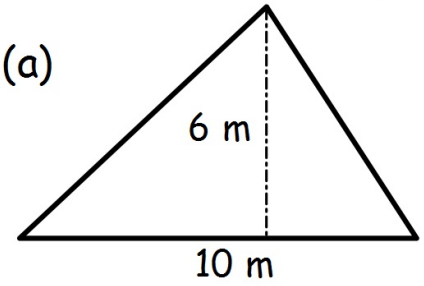
S2 MP2 Revision

Area of Quadrilaterals
Speed, Distance, Time
Equations & Inequations
Significant Figures
Scientific Notation
Percentages
Fractions
Circles
Algebra
(Factorising and Evaluating)

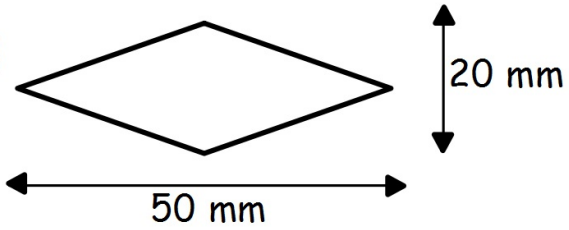
Area of Quadrilaterals

Calculate the area of the following shapes:

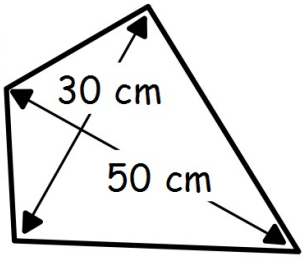
(a)



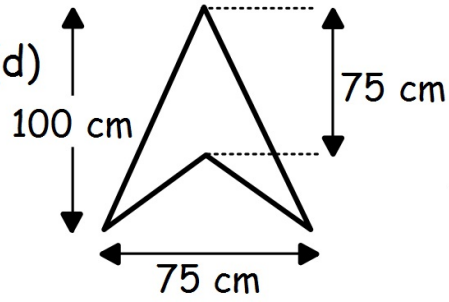
(b)



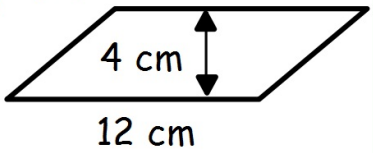
(c)



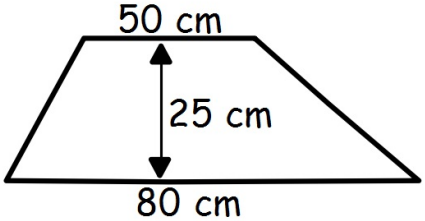
(d)



(e)



(f)



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Speed, Distance, Time

(1) Find the missing piece of information:

	Distance	Speed	Time
(a)	100 miles	25 mph	?
(b)	240 km	?	6 hours
(c)	?	35 mph	3 hours
(d)	75 km	?	2·5 hours

(2) A motor cyclist covered a distance of 35 miles in half an hour. What was his average speed?

(3) A truck travelled 90 miles at an average speed of 40 mph. How long, in hours and minutes, did it take to complete its journey?

(4) It took me $2\frac{1}{2}$ hours to drive 400 miles from Harwood to Deefield. Calculate my average speed for the journey?

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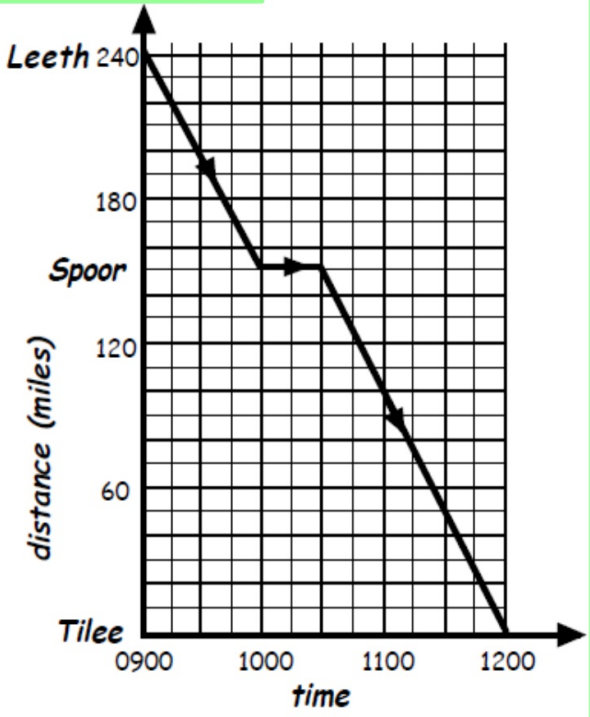
Speed, Distance, Time Graphs

This graph indicates a pilot's journey in his light plane from Leeth back to Tilee.

He set off from Leeth at 0900 and landed at Spoor to pick up supplies. He then completed the rest of his flight to Tilee.



(a) How long did it take to fly from Leeth to Spoor?
(b) How long did he stop in Spoor?
(c) At what time did he set off from Spoor to head to Tilee?
(d) When did he arrive in Tilee?
(e) Calculate the speed of the plane:
  (i) from Leeth to Spoor
  (ii) on the runway at Spoor
  (iii) from Spoor to Tilee

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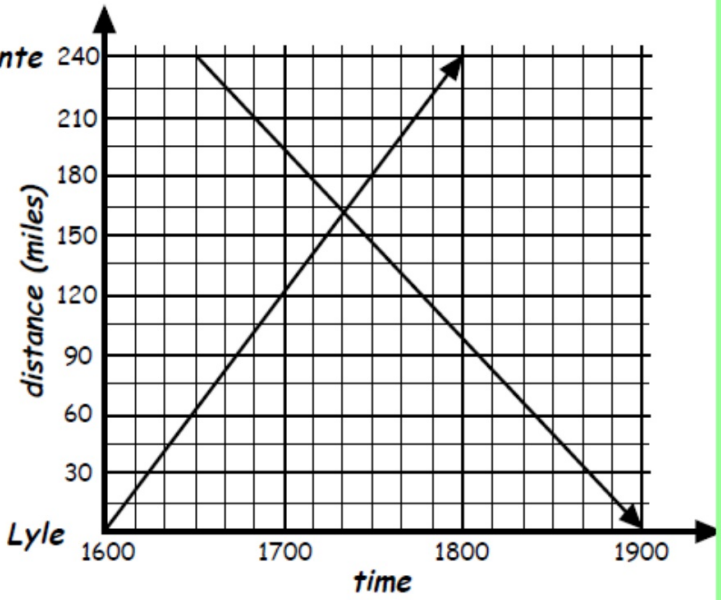
Speed, Distance, Time Graphs

A train leaves Lyle in France and heads off to Nante at 1600.

The 1630 train leaves Nante and heads towards Lyle.

(a) How far is it from Lyle to Nante?
(b) At what time do the two trains pass each other?
(c) Calculate the speed of the 1600 train from Lyle.
(d) Calculate the speed of the 1630 train from Nante.



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Equations & Inequations

(1) Solve the equations:

(a) $2(x + 5) - x - 4 = 7$
(b) $4(x + 2) + 3x - 3 = 12$
(c) $5(x + 2) - 3x = 18$
(d) $3(x - 5) + 4x + 1 = 28$
(e) $2x + 1 + 3(x - 6) = 23$
(f) $8x + 2(x - 9) = 82$
(g) $3(x - 3) + 2(x + 5) = 21$
(h) $5(2x + 1) + 3(1 - 2x) = 20$
(i) $5(2x + 1) - 2(x - 2) = 6x + 13$
(j) $10(x + 3) - 6(x + 1) = 2x + 40$

(2) Don had 9 packets of toffos. He gave 2 packets to Ella, who also had 25 loose toffos. They discovered that they then had exactly the same number of toffos.

(a) Make up an equation to show this information.
(b) Solve the equation to determine how many toffos ther eare in each packet.

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Equations & Inequations

Solve the equations:

(1) $\frac{1}{2}x - 3 = 1$ (2) $\frac{1}{4}x + 7 = 10$ (3) $\frac{1}{8}x - 5 = 0$

(4) $\frac{2}{3}x - 1 = 9$ (5) $1 + \frac{3}{5}x = 13$ (6) $\frac{3}{8}x + 4 = 4$

(7) $\frac{3}{4}x - \frac{1}{2} = 7$ (8) $\frac{1}{2}x + \frac{1}{3} = 4$ (9) $\frac{4}{5}x - \frac{1}{4} = 0$

(10) $\frac{1}{2}x - 5 = \frac{1}{4}$ (11) $\frac{2}{3}x - 1 = \frac{1}{6}$ (12) $\frac{3}{4}x - 1 = \frac{1}{5}$

(13) $\frac{1}{2}x + 1 = \frac{1}{3}x + 4$ (14) $\frac{3}{4}x - 4 = \frac{3}{5}x - 1$ (15) $1 + \frac{5}{8}x = \frac{1}{4}x + 10$

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Equations & Inequations

Solve the equations:

(1) $\frac{x+1}{4} = 3$ (2) $\frac{x+4}{5} = 4$

(3) $\frac{x+2}{3} - 2 = 5$ (4) $8 - \frac{x-5}{3} = 0$

(5) $\frac{2}{3}(6x + 3) - 22 = 0$ (6) $\frac{3}{4}(5x - 1) - 7 = 3\frac{1}{2}$

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

(9) $2 + \frac{3}{10}(2x + 6) = \frac{1}{3}x + 7$ (10) $\frac{2}{3}(2x + 4) + \frac{1}{2}(x - 3) = 14$

(11) $\frac{x-1}{5} + \frac{x+2}{3} = 1$ (12) $\frac{2x-1}{4} - \frac{x+6}{3} = 0$

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Equations & Inequations

Solve the inequations:

(a) $3x + 5 < 23$ (b) $2x + 11 > 27$ (c) $6x - 8 < 4$

(d) $7x + 3 \geq 52$ (e) $10x - 9 \leq 81$ (f) $5x - 23 > 7$

(g) $4x + 4 \leq 4$ (h) $3x - 2 < 25$ (i) $2x + 5 \leq 22$

(j) $2(x + 5) < 16$ (k) $4(x + 8) > 40$ (l) $4(x - 1) \geq 20$

(m) $4(2x + 1) \leq 84$ (n) $2(6x - 4) > 4$ (o) $5(x + 3) < 3x + 21$

(p) $3(2x - 7) \geq 5x + 19$ (q) $2(8x + 1) < 3x + 2$ (r) $7(2x - 1) \leq 12x$

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Significant Figures

(1) How many significant figures does each number have in the following context:

(a) There are **700** pennies in £7

(b) The cost of a soft toy is exactly £**7·50**

(c) There are **180**° in a half-turn.

(d) The volume of a small bottle of juice is **200** ml, correct to the nearest 100 ml.

(2) Round each number to 1 significant figure:

(a) 53 (b) 2 679 (c) 0·251 (d) 0·000 815

(3) Round each number to 2 significant figures:

(a) 308 (b) 5 229 (c) 48·55 (d) 0·003 281

(4) Round each number to 3 significant figures:

(a) 9 812 (b) 72 091 (c) 0·287 45 (d) 0·019 999

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Scientific Notation

(1) Write the following numbers in scientific notation:

(a) 400 (b) 8 000 (c) 16 500 (d) 5 million

(e) 1·89 million (f) $3\frac{1}{4}$ million (g) 70 000 (h) 1 680 000

(i) 47 300 000

(2) Change each of the following from scientific notation to number form:

(a) $2{\cdot}4 \times 10^4$ (b) $6{\cdot}2 \times 10^2$ (c) $7{\cdot}361 \times 10^5$ (d) 9×10^7

(3) Write the following numbers in scientific notation:

(a) 0·005 (b) 0·000 092 (c) 0·027 4 (d) 0·000 002

(e) 0·000 175 (f) 0·368 (g) 0·001 81 (h) 0·000 09

(4) Write the following numbers in full:

(a) $3{\cdot}9 \times 10^{-2}$ (b) $2{\cdot}1 \times 10^{-4}$ (c) $4{\cdot}97 \times 10^{-3}$ (d) $7{\cdot}02 \times 10^{-5}$

(e) $3{\cdot}2748 \times 10^{-1}$ (f) 5×10^{-3} (g) 9×10^{-5} (h) $3{\cdot}007 \times 10^{-6}$

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Percentages

(1) A skirt was priced at £60. It rose by 30%. What is the new cost of the skirt?

(2) A 2 day trip to York cost £180 last year. This year, the price had dropped by 5%. What is the new price of the trip?

(3) When Cara started Primary School, her height was 1·20 metres. By the end of Primary 6, her height had risen by 20%. What was Cara's new height?

(4) An 80 mph train was redesigned to go 25% faster. What was its new maximum speed?

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Fractions

(1) Find:

(a) $\frac{4}{5}+\frac{2}{3}$ (b) $\frac{8}{9}-\frac{2}{3}$ (c) $\frac{4}{5}-\frac{3}{8}$ (d) $2\frac{4}{5}+3\frac{3}{4}$

(e) $1\frac{1}{7}+\frac{3}{5}$ (f) $5\frac{2}{3}-3\frac{3}{5}$ (g) $5\frac{1}{3}-2\frac{3}{4}$

(2) Find:

(a) $\frac{4}{9}\times\frac{7}{8}$ (b) $\frac{2}{3}\times\frac{9}{16}$ (c) $2\frac{1}{3}\times1\frac{1}{5}$ (d) $5\frac{5}{6}\times1\frac{3}{7}$

(e) $\frac{5}{6}\div\frac{2}{3}$ (f) $\frac{7}{9}\div\frac{2}{3}$ (g) $\frac{15}{7}\div\frac{5}{14}$ (h) $3\frac{5}{9}\div2\frac{2}{3}$

(3) A rectangle has length $4\frac{2}{3}$ metres and breadth $2\frac{1}{4}$ metres. Calculate the area of the rectangle.

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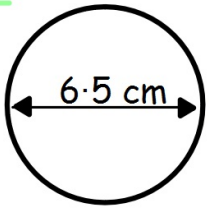
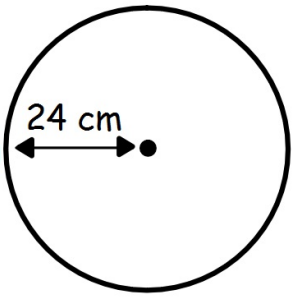
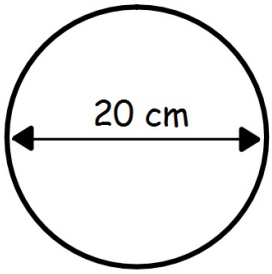
Circles

(1) Calculate the circumference of the circles:

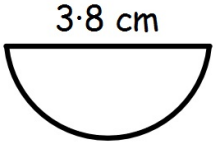
(a) 

(b) 

(2) Calculate the area of the circle:

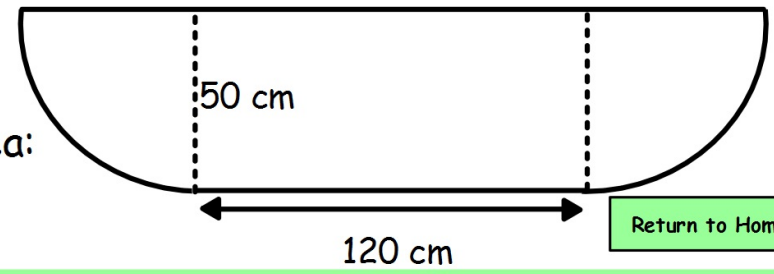


(3) Calculate the perimeter of this shape:



(4) A circle has a circumference of 125·6 mm. Calculate the diameter.

(5) Calculate the area:



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Algebra

(1) Factorise fully:

(a) $3x + 9$ (b) $4y - 14$ (c) $14p - 21$

(d) $wx + wy$ (e) $16xy + 4x$ (f) $15abc - 3ab$

(g) $5y^2 + y$ (h) $16a^3 + 6a^2 + 28a$

(2) If $a = 4$, $b = 3$ and $c = -2$, evaluate:

(a) $5a + b$ (b) $6b - a$ (c) $a^2 + c^2$ (d) abc

(e) $(b - c)^2$ (f) $3a^2$ (g) $\sqrt{a}$ (h) $\frac{c - a}{b}$

(i) $\frac{3a}{bc}$ (j) $\frac{ab^2}{c^2}$ (k) $\sqrt{3a - 2c}$

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