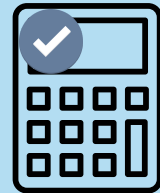


M6 PAPER A CALCULATOR



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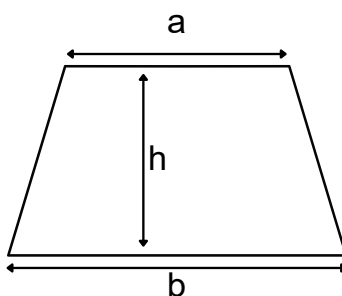
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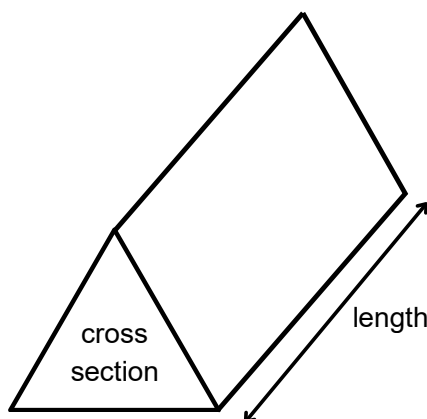


Formula Sheet

Area of a trapezium = $\frac{1}{2}(a + b)h$



Volume of prism = area of cross section x length

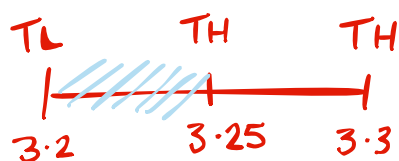




1 Use trial and improvement to solve $x^3 - x = 30$

Give your answer to 1 decimal place.

x	$x^3 - x$	
3	24	Too low
4	60	Too high
3.2	29.568	Too low
3.3	32.637	Too high
3.25	31.078125	Too high



Answer 3.2 [4]



2 Translink records the number of delayed buses arriving at a station.

The number of delayed buses is recorded after every 40 buses.

The table shows some information about the results.

Number of buses	40	80	120	160	200
Number of delayed buses	14	18	<u>30</u>	36	46
Relative frequency of delayed buses	<u>0.35</u>	<u>0.225</u>	0.25	<u>0.225</u>	<u>0.23</u>

a) Complete the relative frequency table.

[3]

b) What is the best estimate for a probability that a bus will be delayed?

Answer 0.23 [1]

c) In one week 1500 buses arrive at this station.

Estimate how many buses **arrive on time**.

$$0.23 \times 1500 = 345 \quad \text{LATE}$$

$$1500 - 345 = 1155$$

Answer 1155 [2]



3 Here are the first five terms of an arithmetic sequence.

3, 8, 13, 18, 23

a) What is the n th term for the sequence?

Answer $5n - 3$ [2]

b) The n th term of a difference sequence is

$3n - 6$

Is **45** a term of this sequence?

You must **show how you get your answer**.

$$\begin{array}{r} 3n - 6 = 45 \\ +6 \quad +6 \\ \hline 3n = 51 \\ n = 17 \end{array}$$

Yes, it is the 17th term in the sequence

Answer Yes [2]

4 a) Write 34 as a binary number.

32	16	8	4	2	1
1	0	0	0	1	0

Answer 100010 [1]

b) Write the binary number 11010 in decimal form

32	16	8	4	2	1
	1	1	0	1	0

$16 + 8 + 2$

Answer 26 [1]

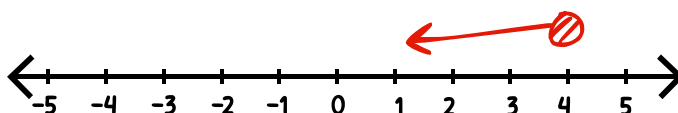


- 5 a) Solve the inequality $4 \leq 16 - 3x$

$$\begin{aligned} &+3x \quad +3x \\ 4+3x &\leq 16 \\ -4 \quad -4 \\ 3x &\leq 12 \quad \div 3 \\ \div 3 \quad \hookrightarrow x &\leq 4 \end{aligned}$$

Answer $x \leq 4$ [2]

- b) Represent your answer on a number line.



[1]

- c) Write down the five biggest integer values that x could be.

Answer 4, 3, 2, 1, 0 [1]

- 6 a) Simplify

$$\frac{x^6 \times x^4}{(x^5)^2} = \frac{x^{10}}{x^{10}} = x^0 = 1$$

Answer 1 [2]

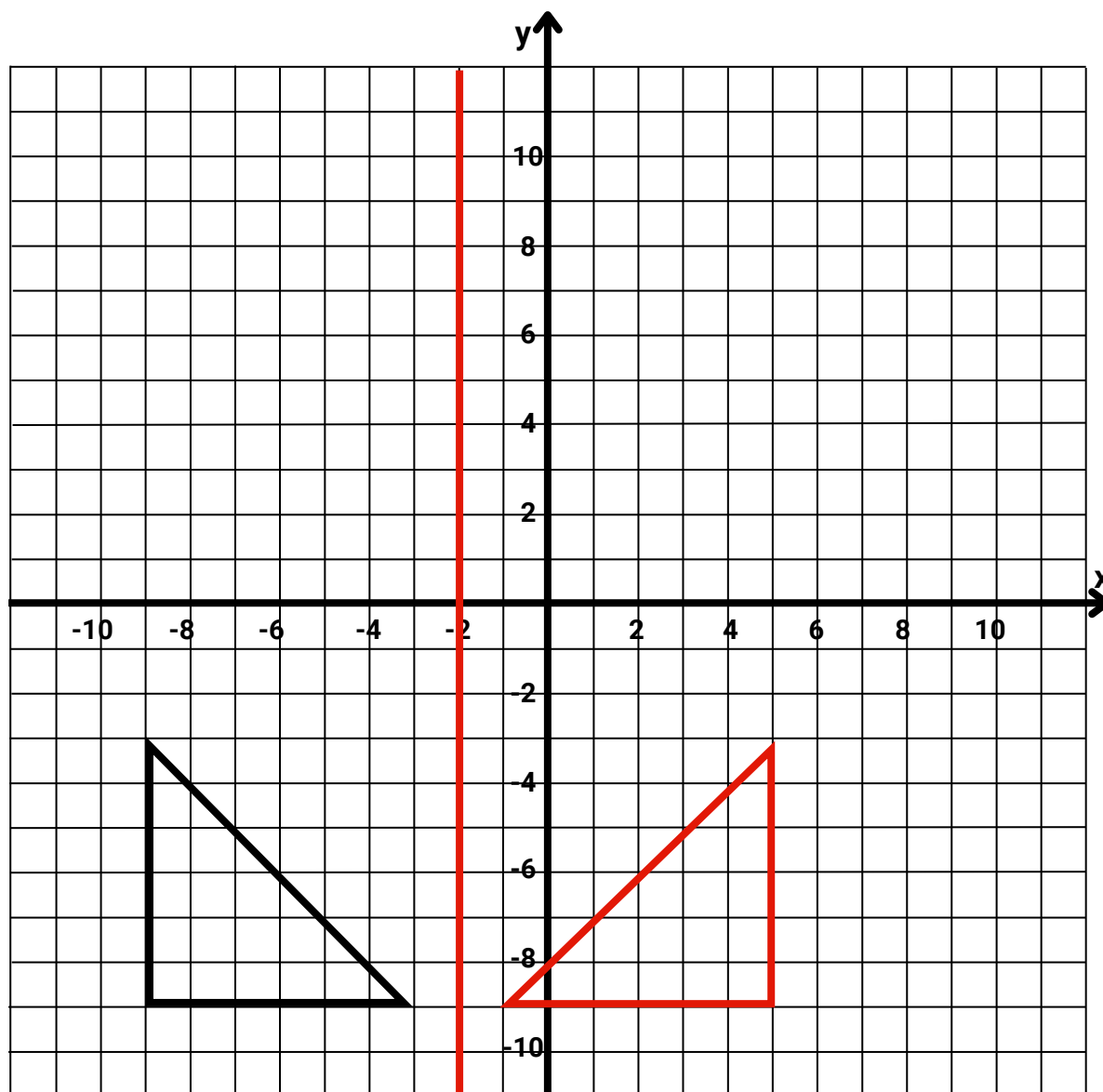
- b) Simplify

$$(2y^3)^4 = 2^4 y^{3 \times 4} = 16y^{12}$$

Answer $16y^{12}$ [2]



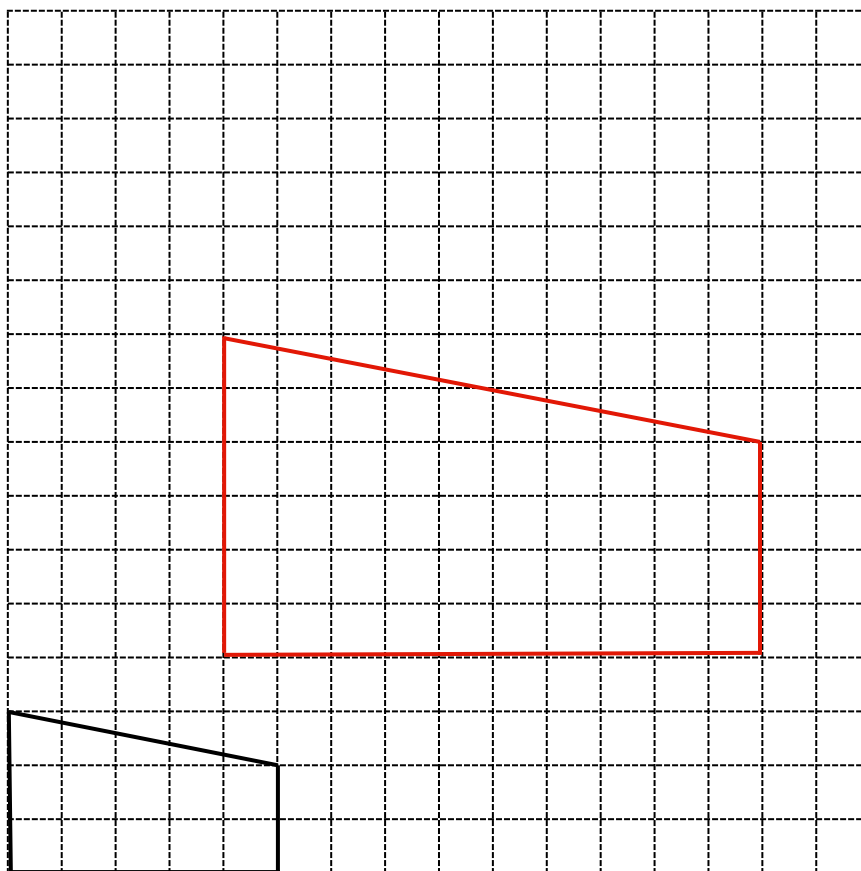
7 Reflect the triangle in the line $x = -2$



[2]



- 8 a) Enlarge the shape below by scale factor 2



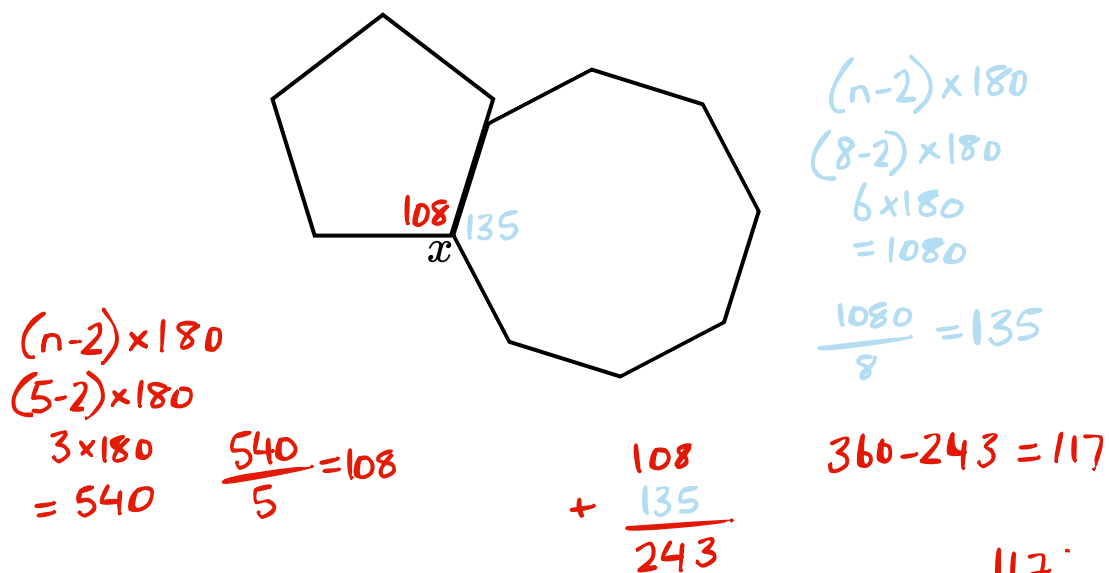
- b) How many times larger is the area of the larger shape than the smaller shape?

$$\times 2^2 = \times 4$$

Answer 4 times [2]



- 9 a) The diagram shows a regular pentagon and a regular octagon joined as shown. Work out the size of angle x .



Answer 117 [3]

- b) Sarah is thinking of a regular polygon.

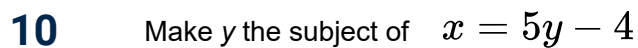
Each interior angle of the polygon is 144° .

How many sides does the polygon have?

$$180 - 144 = 36$$

$$\frac{360}{36} = 10$$

Answer 10 [2]



Answer $y = \frac{x+4}{5}$ [2]

- $$\frac{35}{2} = 17.50$$

Answer £52.50 [3]

- $\div 14 \quad \left(\begin{array}{l} 42 : 56 \\ 3 : 4 \end{array} \right) \div 14$

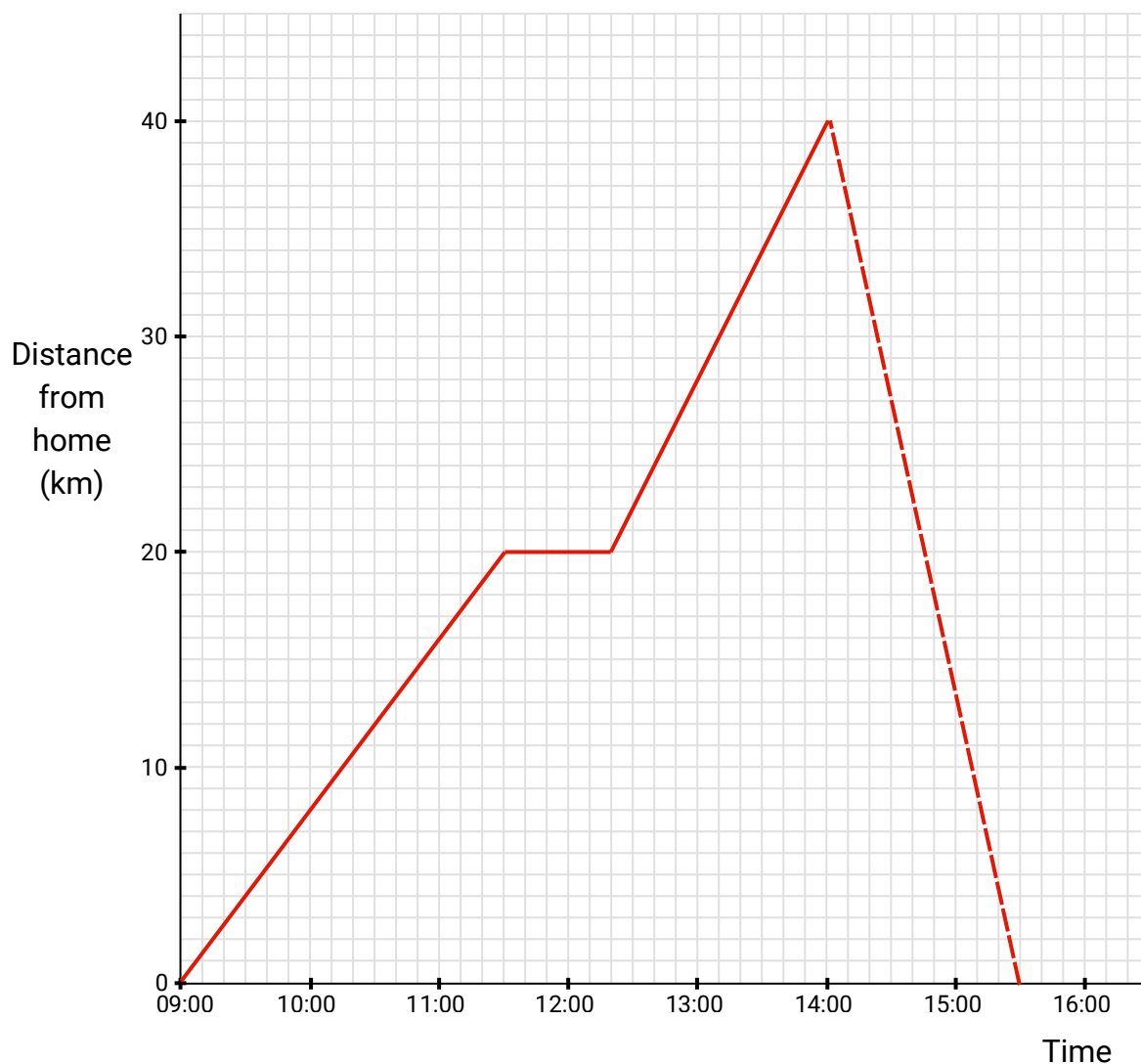
Answer 3:4 [2]



12

A cyclist is going on a Sunday cycle.

The graph shows the distance from home (in km) against time.



- a) Explain the horizontal section of the graph.

Rest / Puncture etc

[1]

- b) The cyclist then returns home, arriving at 15:30.
Complete the graph to show this journey.

[2]



- c) Find the average speed for the whole journey.
Give your answer to 1 decimal place.

$$\begin{aligned} D &= 40 + 40 = 80 \\ T &= 6 \text{ hrs } 30 \text{ mins} = 6.5 \text{ hrs} \\ S &= ? \end{aligned}$$
$$S = \frac{80}{6.5}$$

Answer 12.3 km/h [3]

- 13 a) Rory is driving to the gym.
The speed limit is 50 miles per hour.
Convert this to kilometres per hour.



$$\begin{aligned} 5 \text{ mi} &= 8 \text{ km} \\ 50 &= 80 \end{aligned}$$

Answer 80 km/h [2]

- b) Rory then goes to the gym and attempts a bench press personal best of 80kg.
Convert this to pounds (lb).



$$\begin{aligned} 1 \text{ kg} &= 2.2 \text{ lbs} \\ 80 \times 2.2 &= 176 \text{ lbs} \end{aligned}$$

Answer 176 lbs [2]