



GCSE MATHEMATICS

S21-C300

With Calculator Assessment Resource G

Foundation Tier

Formula list

Area and volume formulae

Where r is the radius of the sphere or cone, l is the slant height of a cone and h is the perpendicular height of a cone:

$$\text{Curved surface area of a cone} = \pi r l$$

$$\text{Surface area of a sphere} = 4\pi r^2$$

$$\text{Volume of a sphere} = \frac{4}{3}\pi r^3$$

$$\text{Volume of a cone} = \frac{1}{3}\pi r^2 h$$

Kinematics formulae

Where a is constant acceleration, u is initial velocity, v is final velocity, s is displacement from the position when $t = 0$ and t is time taken:

$$v = u + at$$

$$s = ut + \frac{1}{2}at^2$$

$$v^2 = u^2 + 2as$$

1. (a) Use $A = \frac{6B}{8}$ to find the value of A when $B = 34$. [2]

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- (b) The cost to hire a bike is given by the formula:

$$\text{Cost} = \text{£}14 + \text{£}5.75 \times \text{number of whole days hired}$$

Tom has £80 to spend.

He wants to hire a bike for as many days as possible.

- For how many whole days can Tom afford to hire a bike? [3]

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2.



- (a) (i) Ami buys a pack of sandwiches and an apple for herself and the same for each of her three children.

How much does this cost altogether? [3]

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- (ii) Ami pays with a £20 note.

How much change should she get? [1]

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(b)

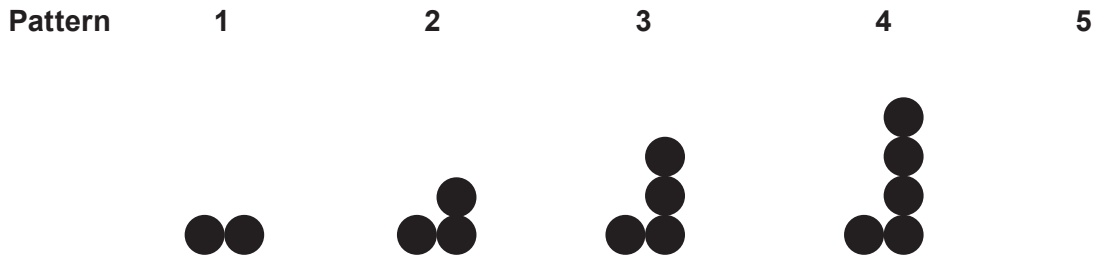
A 'Meal Deal' gives a pack of sandwiches, an apple and a drink for £3.79. Alex buys one 'Meal Deal'.

How much cheaper is this than buying the three items separately? [2]

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3. (a) Here are the first four patterns in a sequence.



(i) Draw pattern 5. [1]

(ii) How many circles will be in pattern 6? [1]

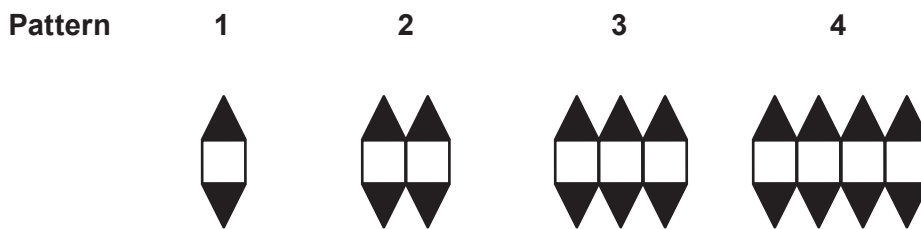
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(iii) Which pattern uses exactly 99 circles? [1]

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(b) Here are the first four patterns in a different sequence.



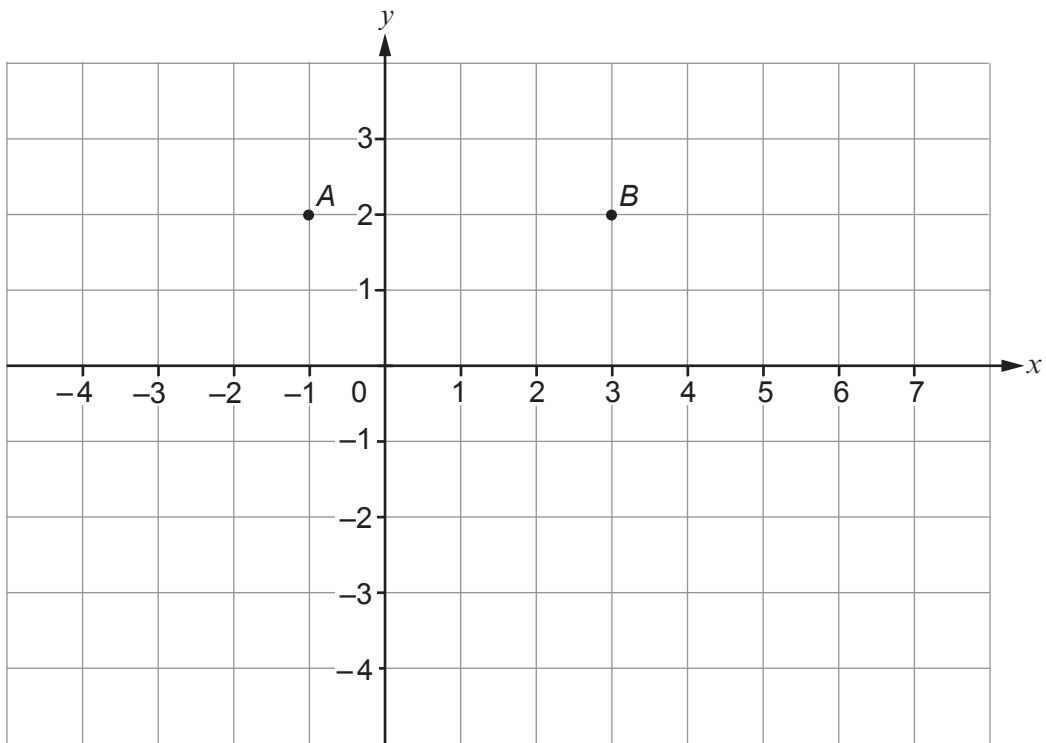
Write down the rule connecting the number of triangles with the number of squares in each pattern. [1]

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Number of triangles =

4. Points A and B are shown on the 1 cm grid below.



(a) $ABCD$ is a rectangle with area 20 cm^2 .

Mark the points C and D on the grid.

[2]

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(b) (i) B is the midpoint of AE .

Mark the point E on the grid.

[1]

(ii) Write down the coordinates of the point E .

[1]

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E is the point (.....,))

5. Jack sells ice-cream cones at a beach cafe.
Each ice-cream cone has **two** scoops of ice cream.



(a) The scoops can be the same or different flavours.

There are three possible flavours to choose from:

- chocolate (C),
- vanilla (V),
- strawberry (S).

List all the possible flavour combinations for two scoops of ice cream.

[2]

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(b) Two scoops of vanilla ice cream is the most popular.
Jack gets 125 single scoops of vanilla ice cream from one tub.
Each tub costs £43.50.

Jack needs to buy enough tubs to make 1300 of his two-scoop vanilla ice-cream cones.

What is the least amount Jack will need to pay?

[5]

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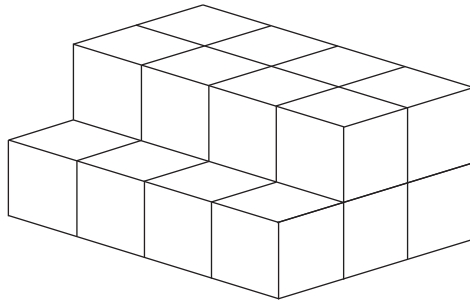
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6. (a) This solid prism is made from identical cubes. Each cube has sides of length 1 cm.

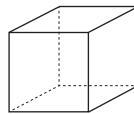


Give the dimensions of a cuboid that could be made with the same number of cubes. [1]

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- (b) The total surface area of a different cube is 144 cm^2 .



To work out the side length of this cube, Mai does the following calculations:

$\sqrt{144} = 12$
$12 \div 6 = 2$
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Mai's method is incorrect.

Explain the mistake that Mai has made.

[1]

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7. (a) n is a whole number where $-4 \leq 2n < 6$.
Write down all the possible values of n .

[2]

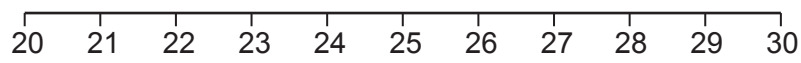
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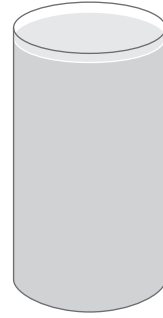
- (b) Represent the inequality $23 < x \leq 28$ on this number line.

[2]



8. A cylindrical glass contains 500 cm^3 of water. The glass has an internal radius of 3.5 cm .

Calculate the height of the water in the glass.



[3]

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9. $ABCD$ is a parallelogram.

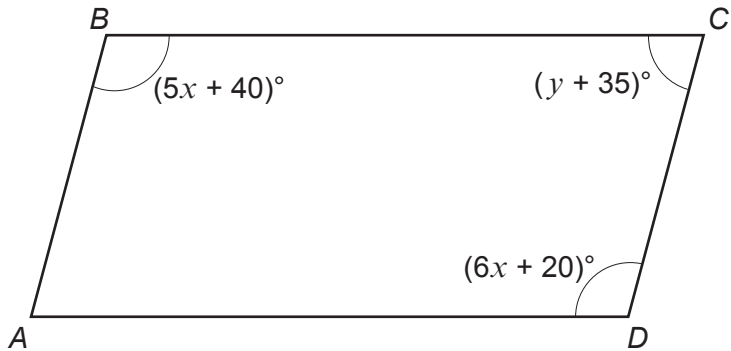


Diagram not drawn to scale

Work out the value of x and the value of y .
You must show all your working.

[5]

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$x = \dots\dots\dots$ $y = \dots\dots\dots$