

**Modified Enlarged 24pt**  
**OXFORD CAMBRIDGE AND RSA EXAMINATIONS**

**Tuesday 11 June 2019 – Morning**

**GCSE (9–1) Mathematics**

**J560/03 Paper 3 (Foundation Tier)**

**Time allowed: 1 hour 30 minutes  
plus your additional time allowance**

**YOU MAY USE:**

**a scientific or graphical calculator  
geometrical instruments  
tracing paper**

**Please write clearly in black ink.**

**Centre number**

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**Candidate number**

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**First name(s)** \_\_\_\_\_

**Last name** \_\_\_\_\_

**READ INSTRUCTIONS OVERLEAF**



# **INSTRUCTIONS**

**Use black ink. You may use an HB pencil for graphs and diagrams.**

**Answer ALL the questions.**

**Read each question carefully before you start your answer.**

**Where appropriate, your answers should be supported with working. Marks may be given for a correct method even if the answer is incorrect.**

**Write your answer to each question in the space provided. Additional paper may be used if required but you must clearly show your candidate number, centre number and question number(s).**

# **INFORMATION**

**The total mark for this paper is 100.**

**The marks for each question are shown in brackets [ ].**

**Use the  $\pi$  button on your calculator or take  $\pi$  to be 3.142 unless the question says otherwise.**

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**Answer ALL the questions.**

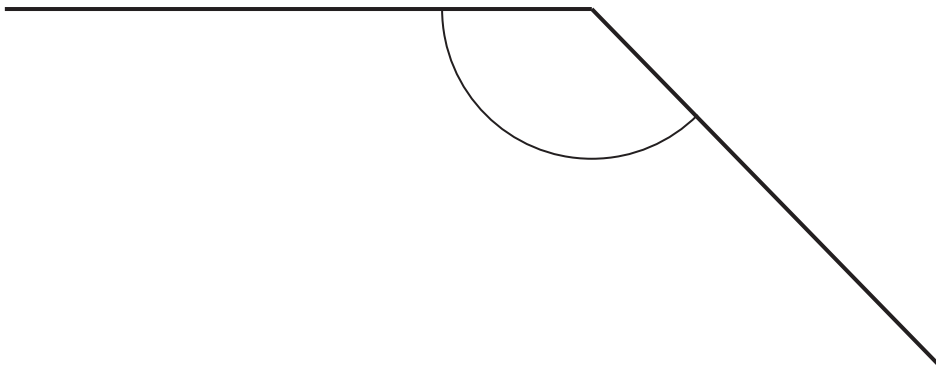
- 1 (a) Write down the mathematical name of this type of angle.  
Choose from the list in the box.**

**acute**

**reflex**

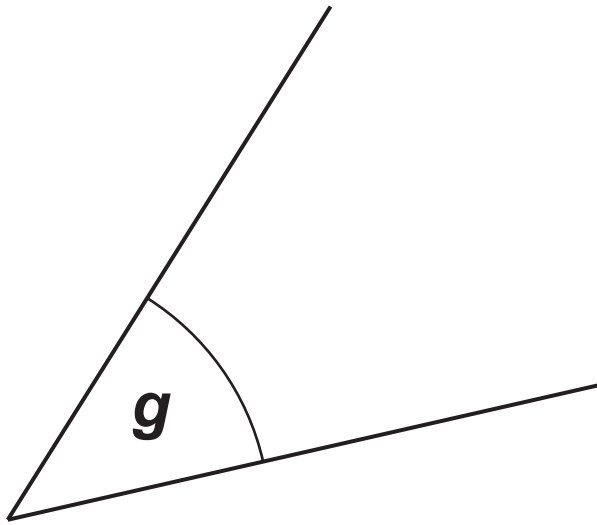
**obtuse**

**right angle**



**(a) \_\_\_\_\_ [1]**

**(b) Measure angle  $g$ .**



**(b) \_\_\_\_\_ ° [1]**

**2 (a) Write 6 : 14 as a ratio in its simplest form.**

**(a) \_\_\_\_\_ : \_\_\_\_\_ [1]**

**(b) The ratio  $20 : 50$  can be written in the form  $1 : n$ .**

**Find the value of  $n$ .**

**(b)  $n =$  \_\_\_\_\_ [2]**

**3 Insert brackets to make each of these calculations correct. [2]**

$$5 \times 3 - 1 = 10$$

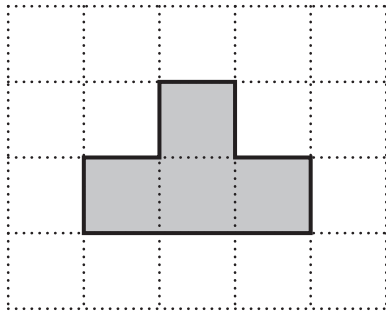
$$3 + 6 - 2 \div 2 = 3.5$$

**4 Work out 20% of 40.**

\_\_\_\_\_ [2]



- 5 A shape is drawn on a one-centimetre grid.**



- (a) Find the perimeter of the shape.**

**(a) \_\_\_\_\_ cm [1]**

- (b) How many lines of symmetry does the shape have?**

**(b) \_\_\_\_\_ [1]**

- 6 (a) These are the first five multiples of 15.**

**15      30      45      60      75**

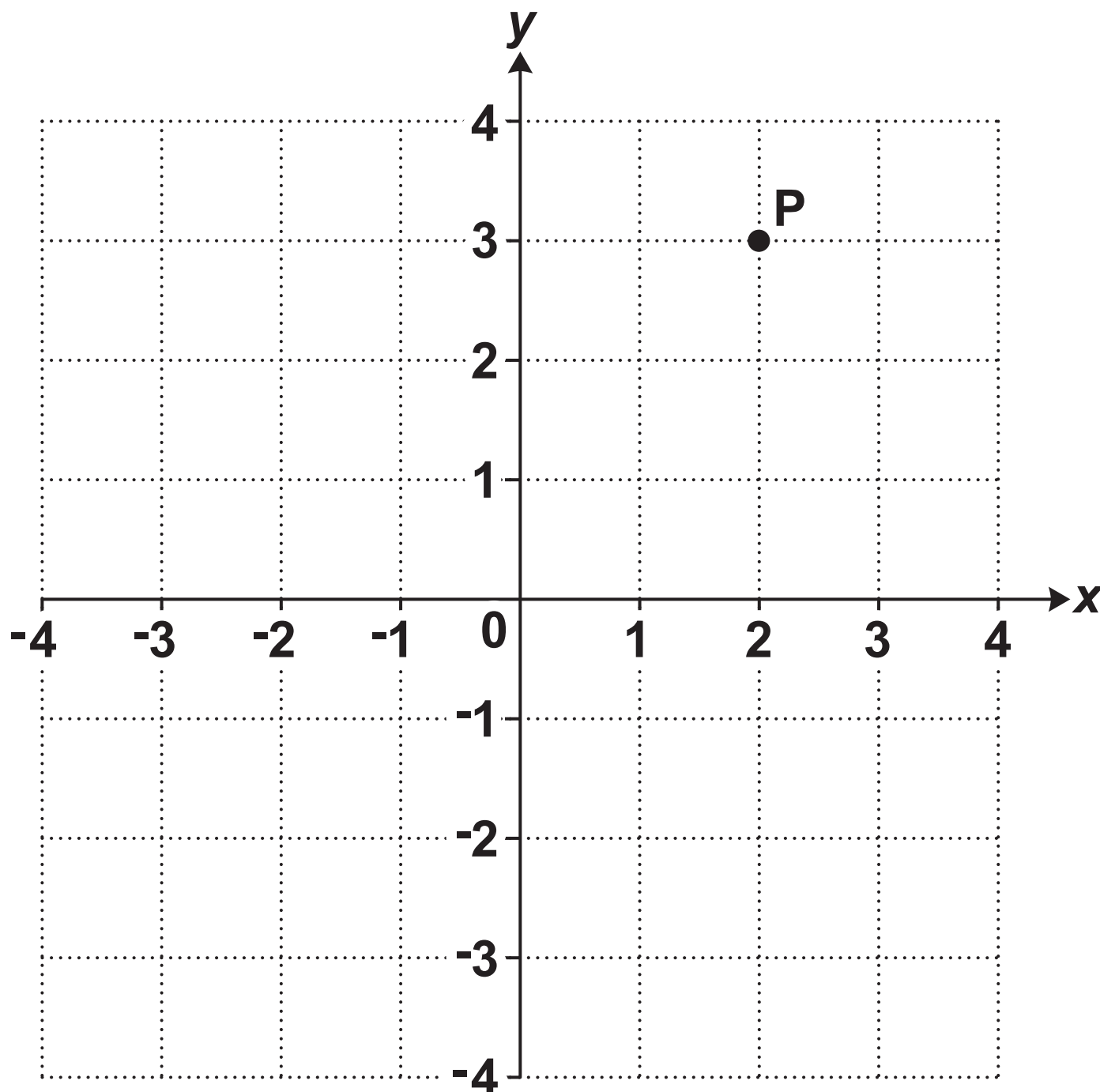
**Write down the first five multiples of 30.**

**(a) \_\_\_\_\_ , \_\_\_\_\_ , \_\_\_\_\_ , \_\_\_\_\_ , \_\_\_\_\_**  
**[2]**

**(b) Write down the lowest common multiple (LCM) of 15 and 30.**

**(b) \_\_\_\_\_ [1]**

**7 Point P is shown on this grid.**



**(a) Write down the coordinates of point P.**

**(a) ( \_\_\_\_\_ , \_\_\_\_\_ ) [1]**

**(b) Draw the line  $x = -2$  on the grid. [1]**

**8 Find the value of  $3g - h$  when  $g = 4$  and  $h = 5$ .**

\_\_\_\_\_ **[2]**

**9 Here are the first three patterns in a sequence.**

**Pattern 1**

•

**Pattern 2**

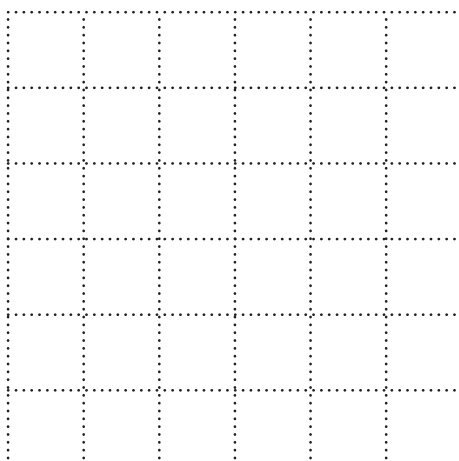
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**Pattern 3**

• • •  
• • •  
• • •

**(a) Draw Pattern 4 in the sequence. [1]**

**Pattern 4**



**(b) Without drawing it, work out how many dots there are in Pattern 8. Explain how you decide.**

\_\_\_\_\_ dots because \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ [2]

**(c) Pattern  $n$  has 196 dots.**

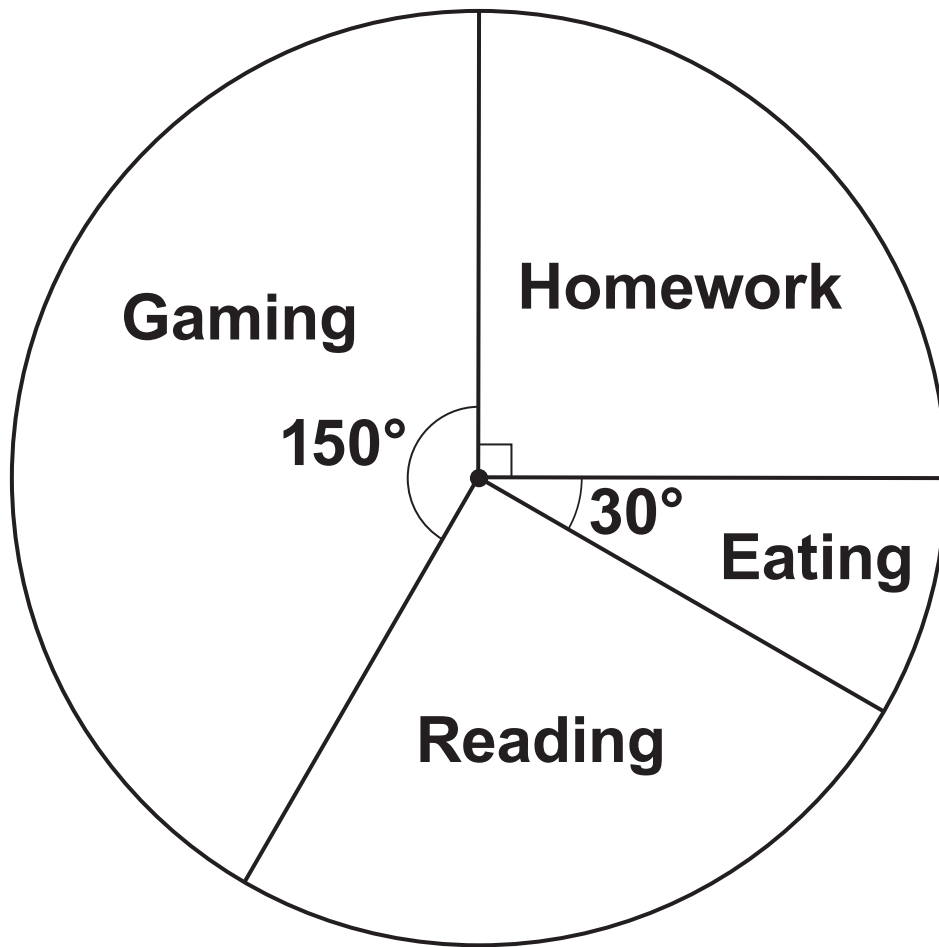
**Find the value of  $n$ .**

**(c)  $n =$  \_\_\_\_\_ [1]**



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**10 The pie chart shows how Jack spent his time one evening.**



**(a) On which activity did Jack spend most time?**

**(a) \_\_\_\_\_ [1]**

**(b) Jack says**

**I spent  $\frac{1}{3}$  of my time on Gaming.**

**Show that he is not correct.**

\_\_\_\_\_ **[2]**

**(c) The pie chart represents 5 hours.**

**Find the time, in hours and minutes,  
that Jack spent reading.**

**(c) \_\_\_\_\_ h \_\_\_\_\_ min [4]**

- 11 Megan's Cafe sells ice cream.  
Customers choose to have a tub or a cone, and a wafer or no wafer.  
They can choose vanilla, lemon or chocolate ice cream.**

**This frequency tree opposite shows the number of people making some of the choices.**

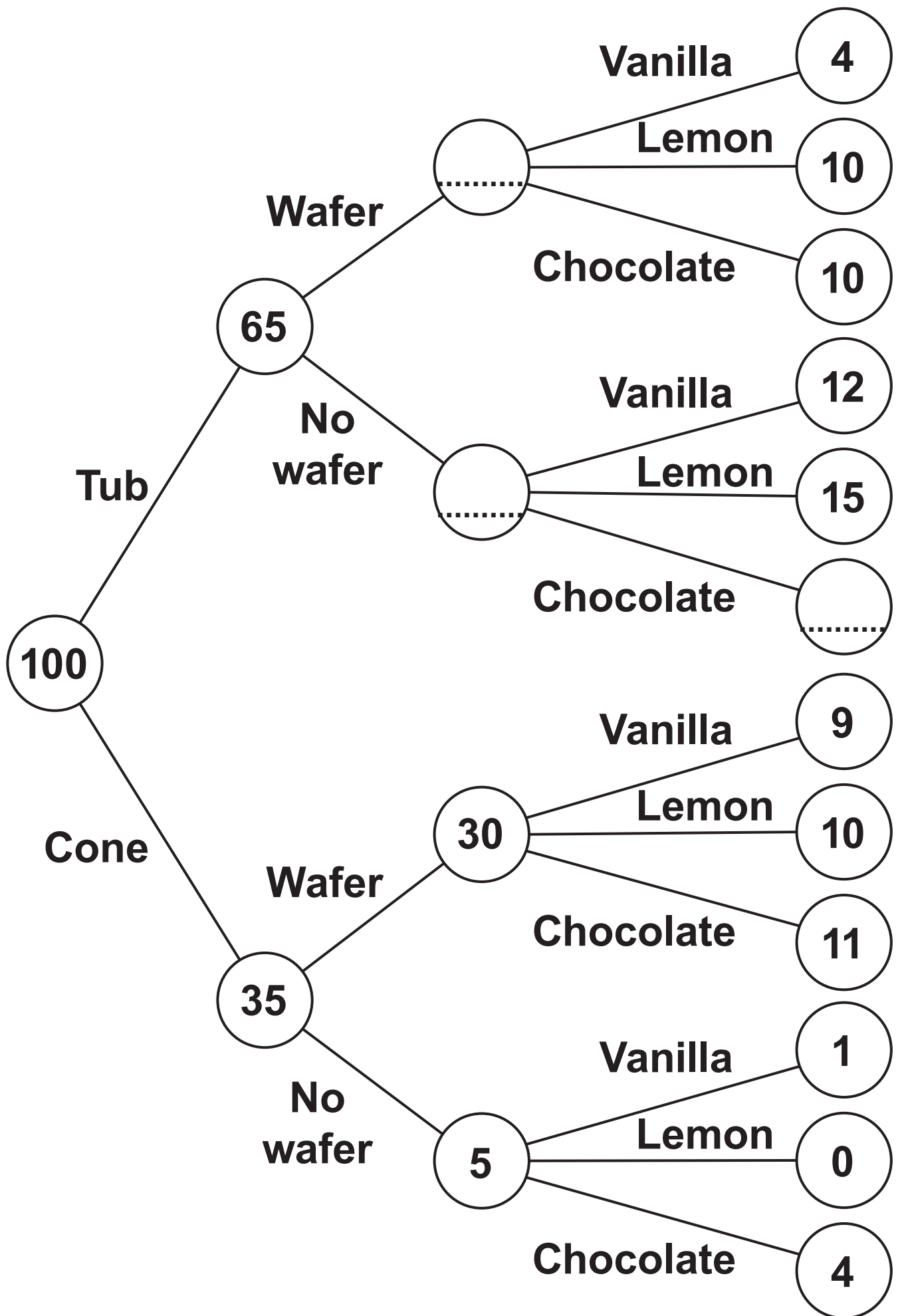
- (a) Anaya buys an ice cream.**

**One choice she can make is  
a cone, no wafer and vanilla.**

**How many different choices can she make?**

**(a) \_\_\_\_\_ [1]**

- (b) Complete the frequency tree. [2]**



**(c) Which flavour of ice cream was most popular?  
Show how you decide.**

**(c) \_\_\_\_\_ [3]**

**12 Solve.**

$$4x + 5 = 35$$

$$x = \underline{\hspace{4cm}} \quad [2]$$

**13 Delroy drives 240 miles.  
His car averages 40 miles per gallon of petrol.  
Petrol costs £1.30 per litre.**

**1 gallon is 4.5 litres.**

**How much does Delroy spend on petrol  
for this journey?**

**£ \_\_\_\_\_ [4]**



**14 Joan makes cups of tea and coffee at a lunch club.**

**Each cup requires 250 ml of boiling water.**

**She has a kettle that boils up to 1.7 litres of water each time.**

**She boils 10 litres of water in an urn.**

**She then uses the kettle to boil the rest of the water she needs.**

**Find the least number of times that Joan needs to boil the kettle to make 56 cups.**

**Show how you decide.**

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**[5]**

**15 (a) 50 sweets weigh 200 g.**

**If each sweet weighs the same,  
work out the weight of 7 sweets.**

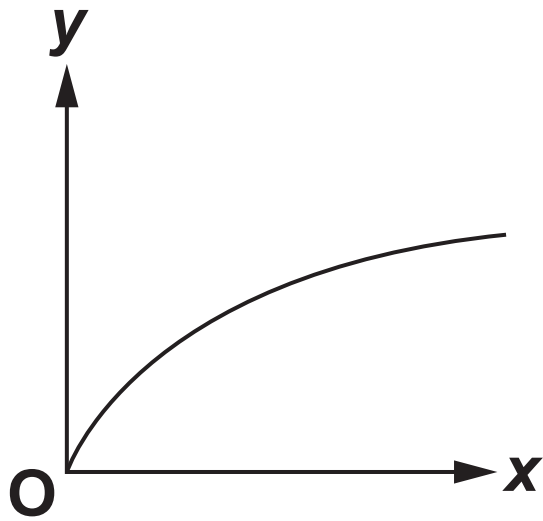
**(a) \_\_\_\_\_ g [2]**

**(b)  $b$  is directly proportional to  $a$ .  
 $b$  is 10 when  $a$  is 8.**

**Work out  $b$  when  $a$  is 9.**

**(b)  $b =$  \_\_\_\_\_ [2]**

(c) A graph is drawn below.



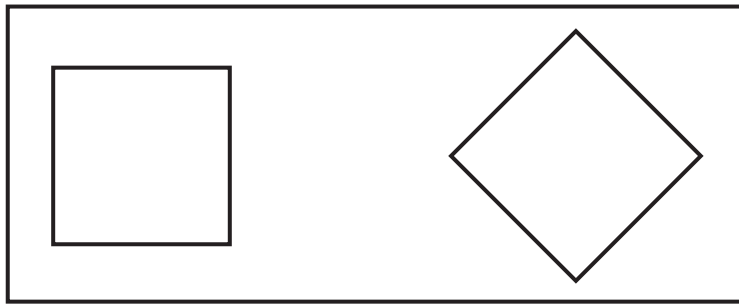
Explain how you know that  $y$  is not directly proportional to  $x$ .

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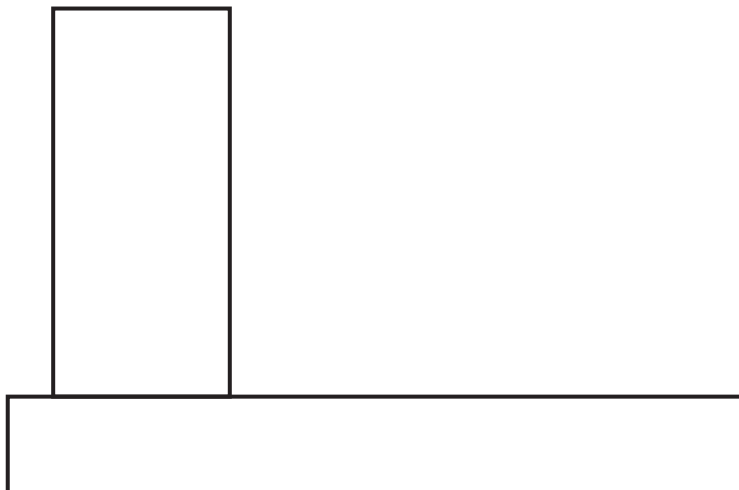
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[1]

**16 This is the plan view of a 3D object.**



**Complete the diagram below to show the front view of the 3D object from A. [2]**



**17 A grain of salt weighs  $6.48 \times 10^{-5}$  kg on average.  
A packet contains 0.35 kg of salt.**

**(a) Use this information to calculate the number of grains of salt in the packet.**

**(a) \_\_\_\_\_ [2]**

**(b) Explain why your answer to part (a) is unlikely to be the actual number of grains of salt in the packet.**

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**[1]**

**18 Tom researches the weights of plant seeds.**

**One poppy seed weighs  $3 \times 10^{-4}$  grams.**

**250 pumpkin seeds weigh 21 grams.**

**One sesame seed weighs  $3.64 \times 10^{-6}$  kilograms.**

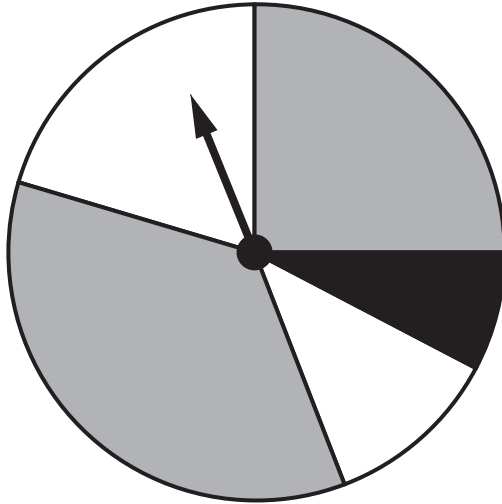
**Write the three types of seed in order according to the weight of one seed. Write the lightest type of seed first. You must show how you decide.**

\_\_\_\_\_ , \_\_\_\_\_ , \_\_\_\_\_ **[4]**  
*lightest*



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- 19 (a) This spinner has two grey sections, two white sections and one black section.**



**Vlad says**

**The probability of the spinner landing on black is  $\frac{1}{5}$ .**

**Explain why Vlad is not correct.**

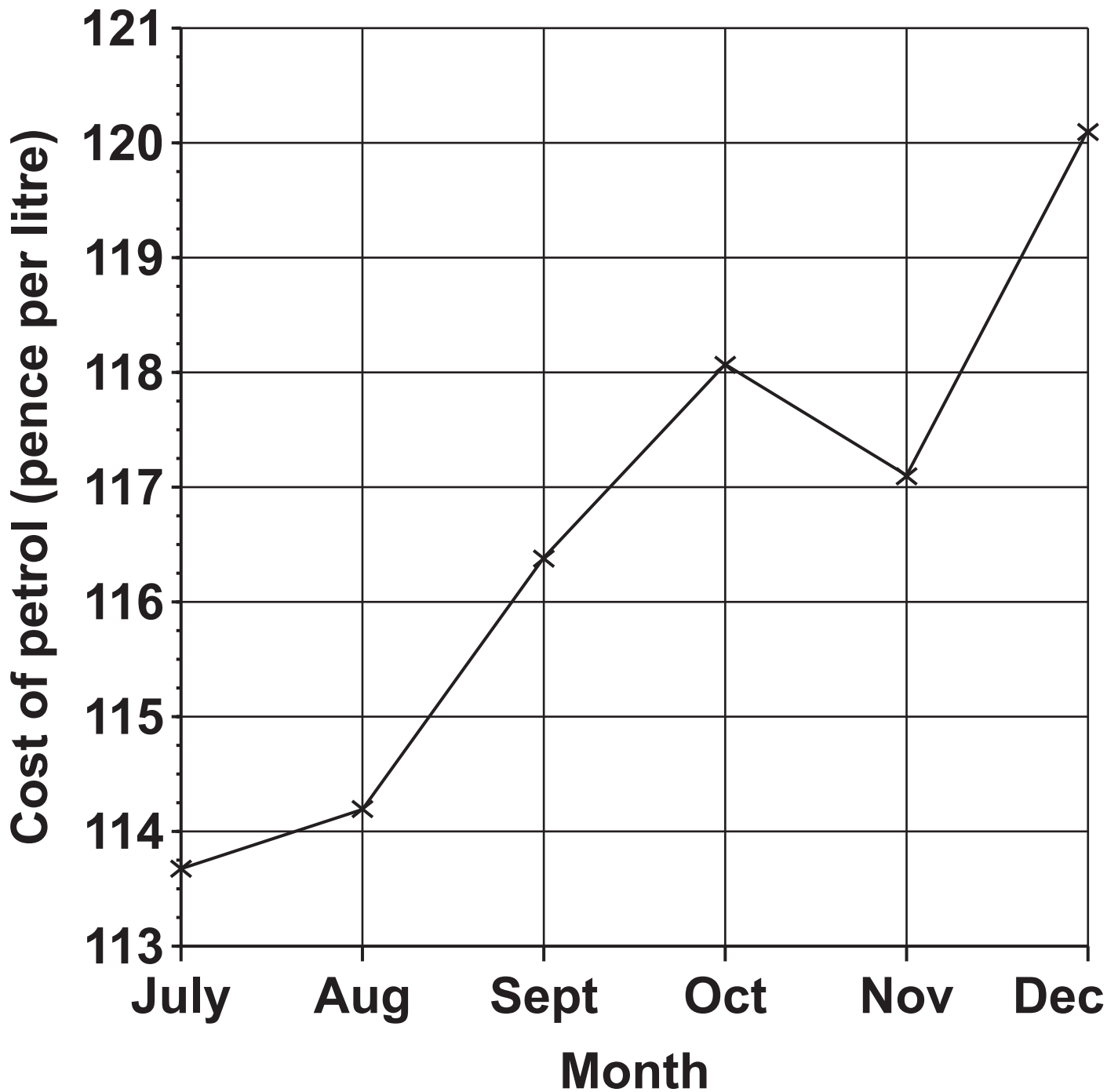
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**[1]**

- (b) The graph opposite shows the cost of a litre of petrol for the last six months of 2017.**



**Explain why this graph is misleading.**

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**[1]**

**20 Sophie is organising a raffle.**

**Each raffle ticket costs 50p.**

**She sells 400 tickets.**

**The probability that a ticket, chosen at random, wins a prize is 0.1.**

**Each winning ticket receives a prize worth £3.**

**Sophie says**

**I expect the raffle to make over £100 profit.**

**Show that Sophie is wrong.**

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**[4]**

**21 A bag contains some counters.**

**There are 300 counters in the bag.**

**There are only red, white and blue counters in the bag.**

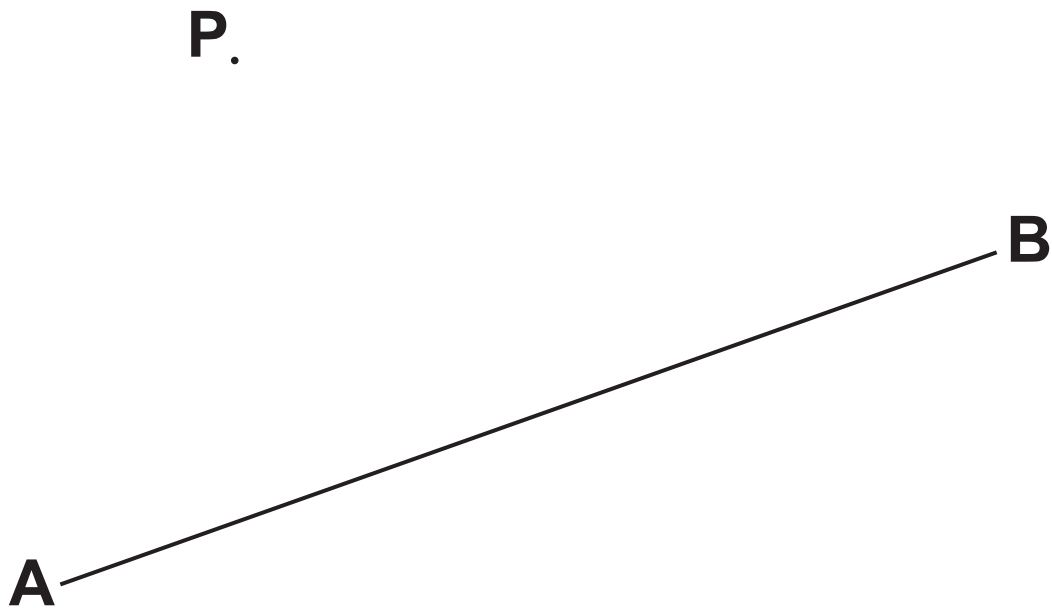
**The probability of picking a blue counter is  $\frac{23}{50}$ .**

**The ratio of red counters to white counters is 2 : 1.**

**Calculate the number of red counters in the bag.**

\_\_\_\_\_ **[4]**

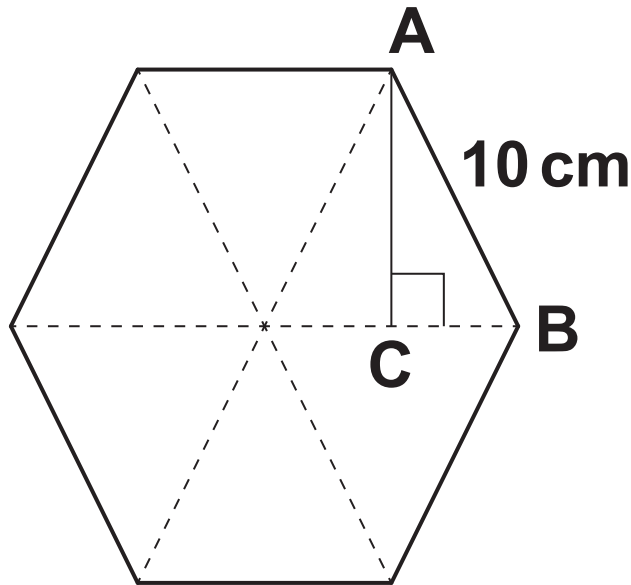
**22 Construct the perpendicular from the point P to the line AB.  
Show all of your construction lines. [2]**





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- 23** The diagram shows a regular hexagon made from six equilateral triangles. Each side is 10 cm. The angle  $ACB$  is a right angle.



**Not to scale**

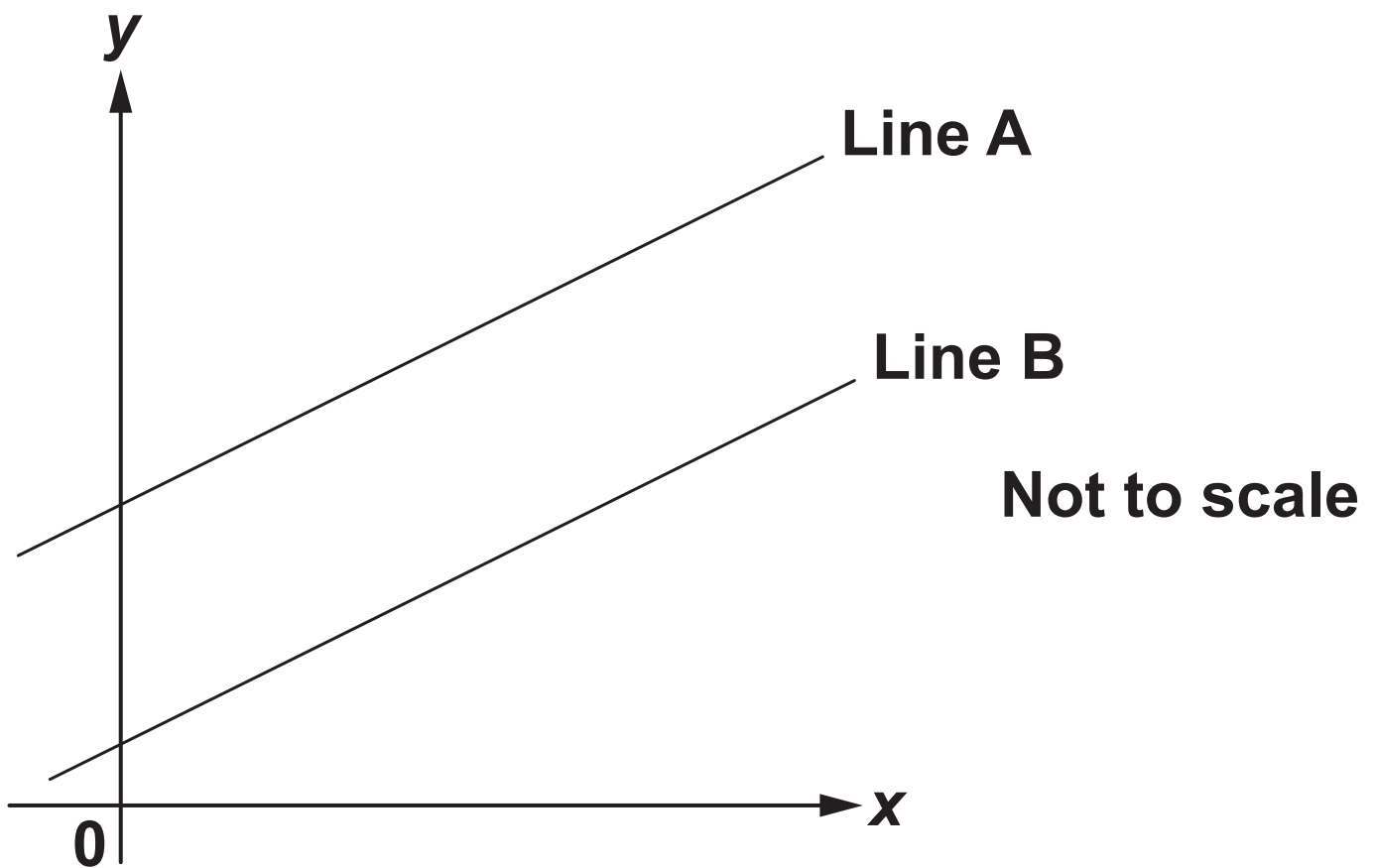
- (a)** Show that  $AC = 8.66$  cm, correct to 3 significant figures. Use the space below. [4]

**(b) (i) Show that the area of triangle ACB is  $21.7 \text{ cm}^2$ , correct to 3 significant figures. Use the space below. [2]**

**(ii) Find the area of the hexagon, giving your answer to an appropriate degree of accuracy.**

**(ii) \_\_\_\_\_  $\text{cm}^2$  [2]**

**24 The graph shows two parallel lines, Line A and Line B.**



**Line A has equation  $y = 6x + 7$ .**

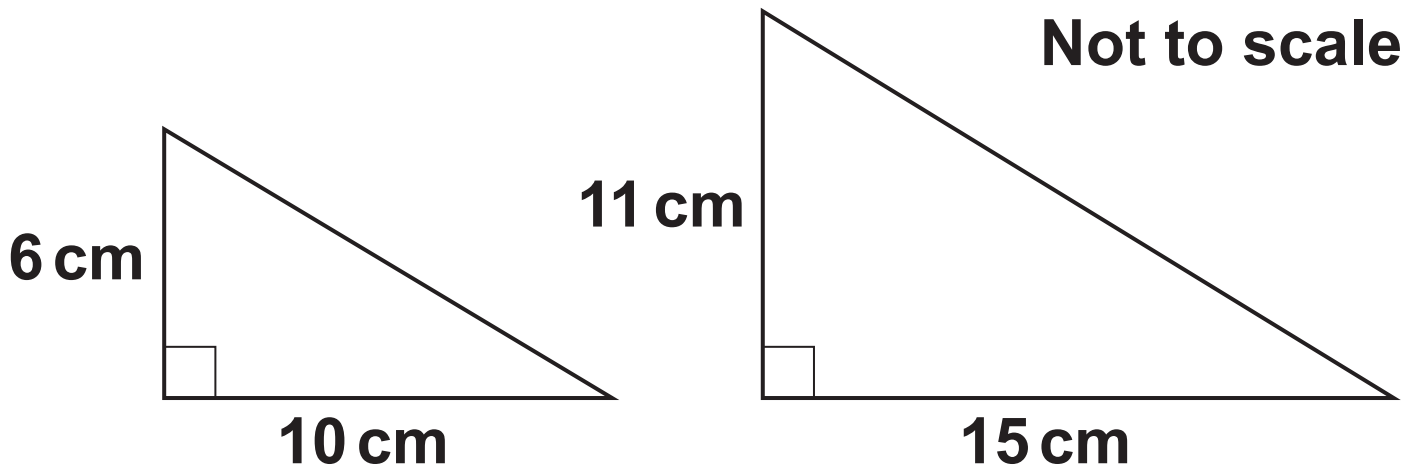
**Line B passes through the point  $(4, 26)$ .**

**Find the equation of Line B.**

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**[4]**

**25 Are these two triangles mathematically similar?  
Show how you decide.**



\_\_\_\_\_ **because** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ **[3]**

- 26 (a) A number,  $g$ , is given as 4.05, correct to 2 decimal places.

Complete the error interval for  $g$ .

(a) \_\_\_\_\_  $\leq g <$  \_\_\_\_\_ [2]

- (b) A number,  $h$ , is given as 3, truncated to 1 significant figure.

Complete the error interval for  $h$ .

(b)  $3 \leq h <$  \_\_\_\_\_ [1]



**27 Solve by factorising.**

$$x^2 + 3x - 10 = 0$$

$$x = \underline{\hspace{2cm}} \text{ or } x = \underline{\hspace{2cm}} [3]$$

**28 (a) Simplify.**

**(i)  $h^3 \times h^{-3}$**

**(a) (i) \_\_\_\_\_ [1]**

**(ii)  $\frac{f^9}{f^3}$**

**(ii) \_\_\_\_\_ [1]**

- (b) The length of each side of a plastic cube is  $2a$  millimetres.  
The cube has mass  $32a^2$  grams.

Find an expression for the density of the cube in its simplest form.  
Give the units of your answer.

(b) density = \_\_\_\_\_  
units \_\_\_\_\_ [5]

END OF QUESTION PAPER



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