Instructions

Answers

This means write down your answer or show your working and your answer.

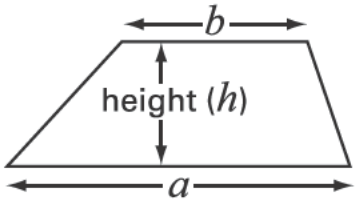
Calculators

You **must not** use a calculator in this test.

Formulae

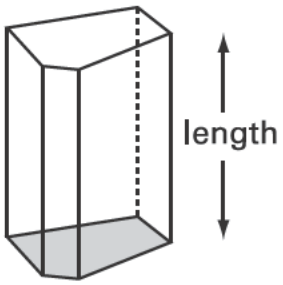
You might need to use these formulae.

Trapezium



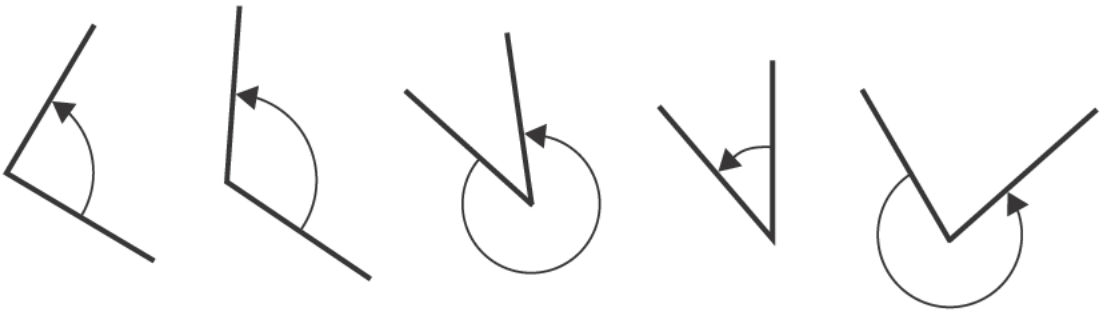
$$\text{Area} = \frac{(a+b)}{2} \times h$$

Prism



Volume = area of cross-section × length

1. Look at these angles.



angle P angle Q angle R angle S angle T

(a) One of the angles measures **120°**

Write its letter.

. . . . . .

. . . .
1 mark

(b) Complete the drawing below to show an angle of **157°**

Label the angle 157°

. . . .

. . . .
2 marks

(c) 15 pupils measured an angle.

Here are their results.

Angle measured as	Number of pupils
45°	5
134°	3
135°	4
136°	3

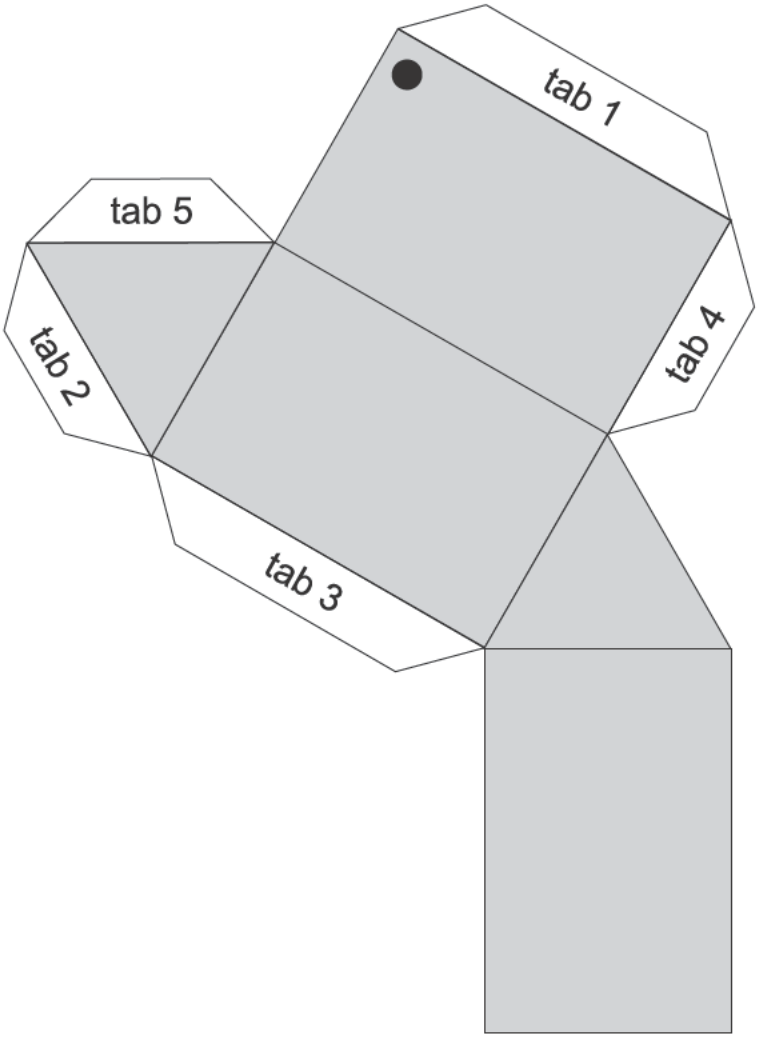
Use the results to decide what the angle is most likely to measure.

The angle is . . . . . °

How did you decide?

. . . .
1 mark

2. The sketch shows the net of a triangular prism.



The net is folded up and glued to make the prism.

(a) Which edge is **tab 1** glued to?
On the diagram, label this edge A

. . . .
1 mark

(b) Which edge is **tab 2** glued to?
Label this edge B

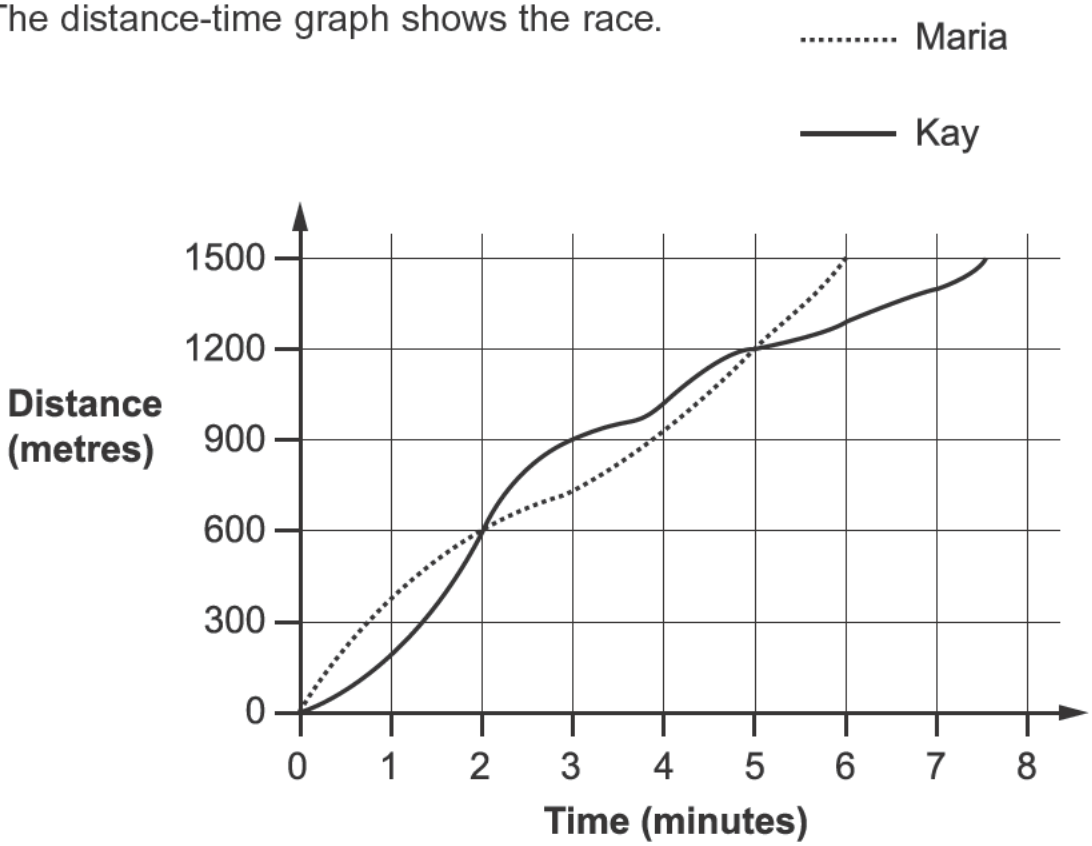
. . . .
1 mark

(c) The corner marked ● meets two other corners.
Label these two other corners ●

. . . .
1 mark

3. Maria and Kay ran a 1500 metres race.

The distance-time graph shows the race.



Use the graph to help you fill in the gaps in this report of the race.

✎ Just after the start of the race, Maria was in the lead.

At 600 metres, Maria and Kay were level.

Then Kay was in the lead for . . . . . minutes.

At . . . . . metres, Maria and Kay were level again. . . . .

. . . . . won the race. . . . .
2 marks

Her total time was . . . . . minutes.

. . . . . finished . . . . . minutes later. . . . .
1 mark

4. The table shows some percentages of amounts of money.

	£10	**£30**	**£45**
5%	50p	£1.50	£2.25
10%	£1	£3	£4.50

You can use the table to help you work out the missing numbers.

15% of £30 = £ . . . .
1 mark

£6.75 = 15% of £ . . . .
1 mark

£3.50 = ... % of £10 . . . .
1 mark

25p = 5% of £ . . . .
1 mark

5.

(a) **240 people** paid the entrance fee on Monday.

How much money is that altogether?

Show your working.

£ . . . .

. . . .

2 marks

(b) The museum took **£600** in entrance fees on Friday.

How many people paid to visit the museum on Friday?

Show your working.

. . . .

. . . . . people . . . .

2 marks

6. Write each expression in its simplest form.

$7 + 2t + 3t$

✎ . . . .

1 mark

$b + 7 + 2b + 10$

✎ . . . .

1 mark

$(3d + 5) + (d - 2)$

✎ . . . .

1 mark

$3m - (-m)$

✎ . . . .

1 mark

7. (a) Two numbers **multiply** together to make **–15**
They **add** together to make **2**

What are the two numbers?

. . . . . and . . . . . .

1 mark

(b) Two numbers **multiply** together to make **–15**,
but **add** together to make **–2**

What are the two numbers?

. . . . . and . . . . . .

1 mark

(c) Two numbers **multiply** together to make **8**,
but **add** together to make **– 6**

What are the two numbers?

. . . . . and . . . . . .

1 mark

(d) The square of 5 is 25
The square of **another** number is also 25

What is that other number?

. . . . . .

1 mark

8. There are some cubes in a bag.
The cubes are either **red** (R) or **black** (B).

The teacher says:

> If you take a cube at random out of the bag, the probability that it will be **red** is $\frac{1}{5}$

(a) What is the probability that the cube will be black?

. . . . . .

1 mark

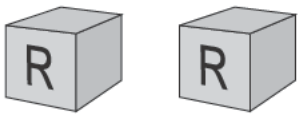
(b) A pupil takes one cube out of the bag.
It is red.

What is the **smallest** number of **black** cubes there could be in the bag?

. . . . . .

1 mark

(c) Then the pupil takes another cube out of the bag.
It is also red.



From this new information, what is the **smallest** number of **black** cubes there could be in the bag?

. . . . . .

1 mark

(d) A different bag has **blue** (B), **green** (G) and **yellow** (Y) cubes in it.
There is at least one of each of the three colours.

The teacher says:

> If you take a cube at random out of the bag, the probability that it will be **green** is $\frac{3}{5}$

There are **20** cubes in the bag.

What is the **greatest** number of yellow cubes there could be in the bag?

Show your working.

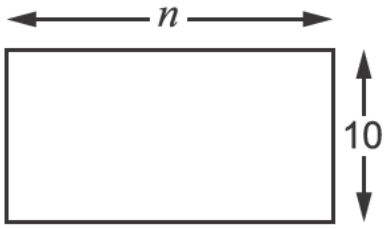
. . . .

. . . .

2 marks

9. Jenny and Alan each have a rectangle made out of paper.

One side is 10cm.
The other side is n cm.



(a) They write expressions for the **perimeter** of the rectangle.

Jenny writes $2n + 20$

Alan writes $2(n + 10)$

Tick (✓) the true statement below.

Jenny is correct and Alan is wrong. ☐

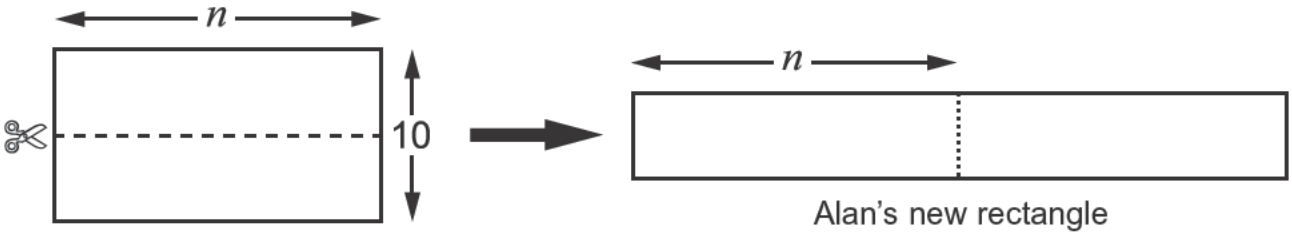
Jenny is wrong and Alan is correct. ☐

Both Jenny and Alan are correct. ☐

Both Jenny and Alan are wrong. ☐

. . . .
1 mark

(b) Alan cuts his rectangle, then puts the two halves side by side.

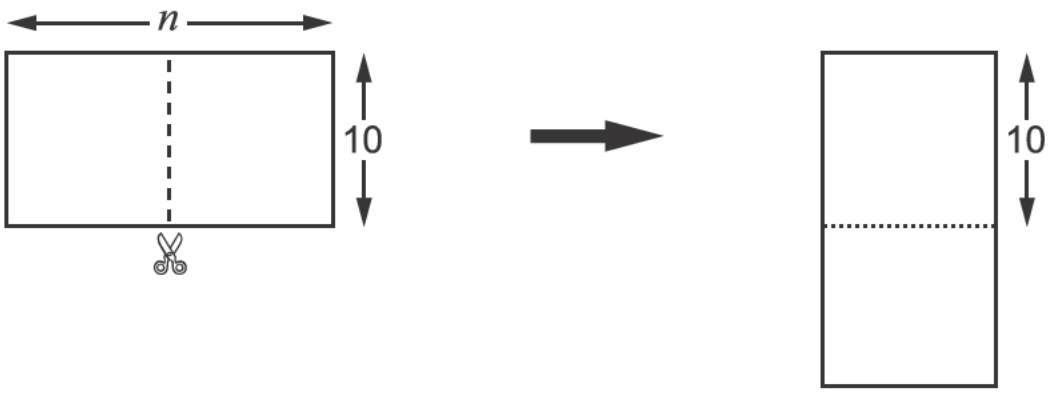


What is the perimeter of Alan's new rectangle?
Write your expression as simply as possible.

. . . .

. . . .
2 marks

(c) Jenny cuts her rectangle a different way, and puts one half below the other.



Jenny's new rectangle

What is the perimeter of Jenny's new rectangle?

Write your expression as simply as possible.

. . . .

. . . .

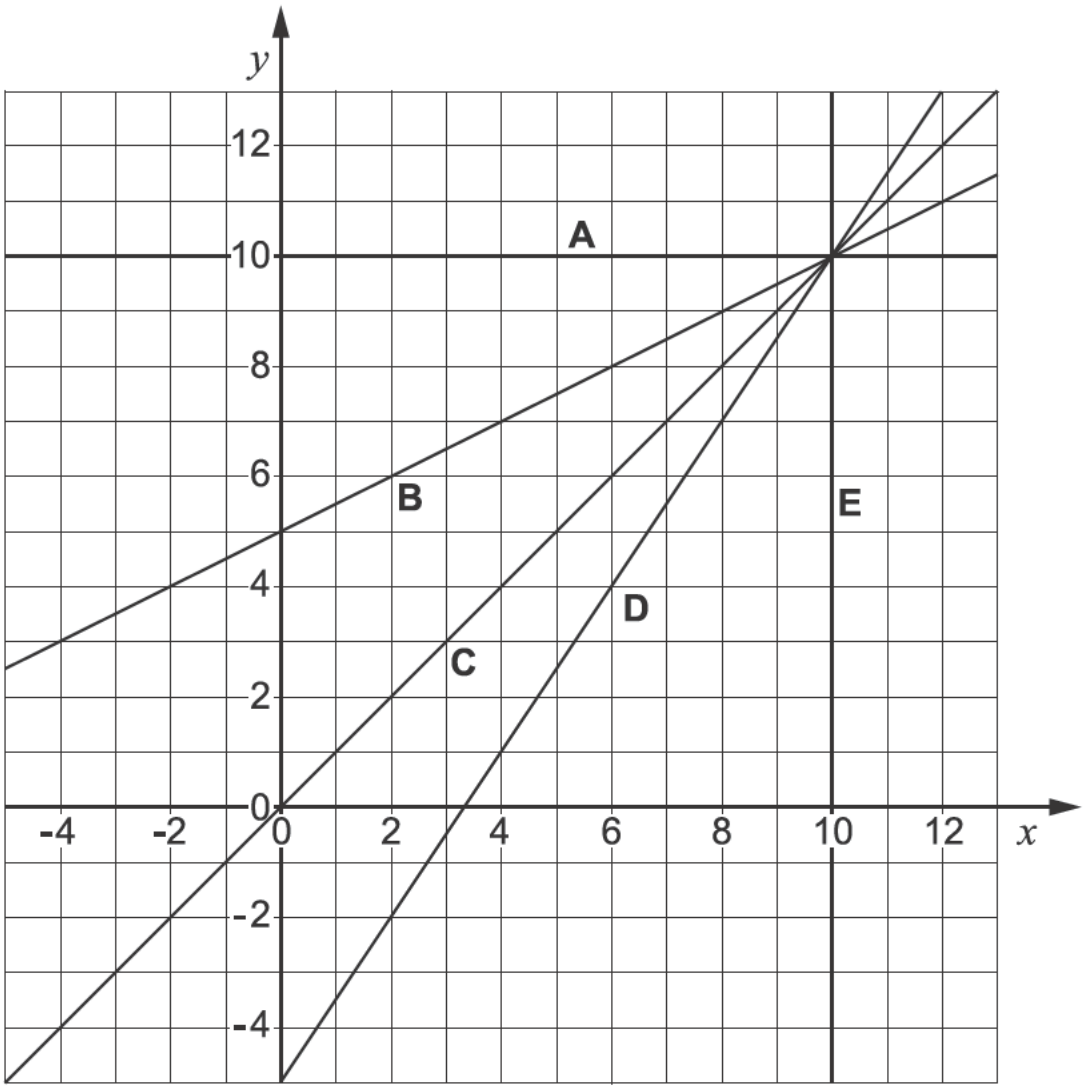
2 marks

(d) What value of n would make the perimeter of Jenny's new rectangle the **same value** as the perimeter of Alan's new rectangle?

. . . .

1 mark

10. These straight line graphs all pass through the point (10, 10)



(a) Fill in the gaps to show which line has which equation.

line . . . . . has equation $x = 10$

line . . . . . has equation $y = 10$

line . . . . . has equation $y = x$

line . . . . . has equation $y = \frac{3}{2}x - 5$

line . . . . . has equation $y = \frac{1}{2}x + 5$

2 marks

(b) Does the line that has the equation $y = 2x - 5$ pass through the point (10, 10)?

Explain how you know.

. . . .

1 mark

11. (a) Circle the **best** estimate of the answer to

$$72.34 \div 8.91$$

6 7 8 9 10 11

. . . .
1 mark

(b) Circle the **best** estimate of the answer to

$$32.7 \times 0.48$$

1.2 1.6 12 16 120 160

. . . .
1 mark

(c) Estimate the answer to $\dfrac{8.62 + 22.1}{5.23}$

Give your answer to **1 significant figure**.

. . . . . .

. . . .
1 mark

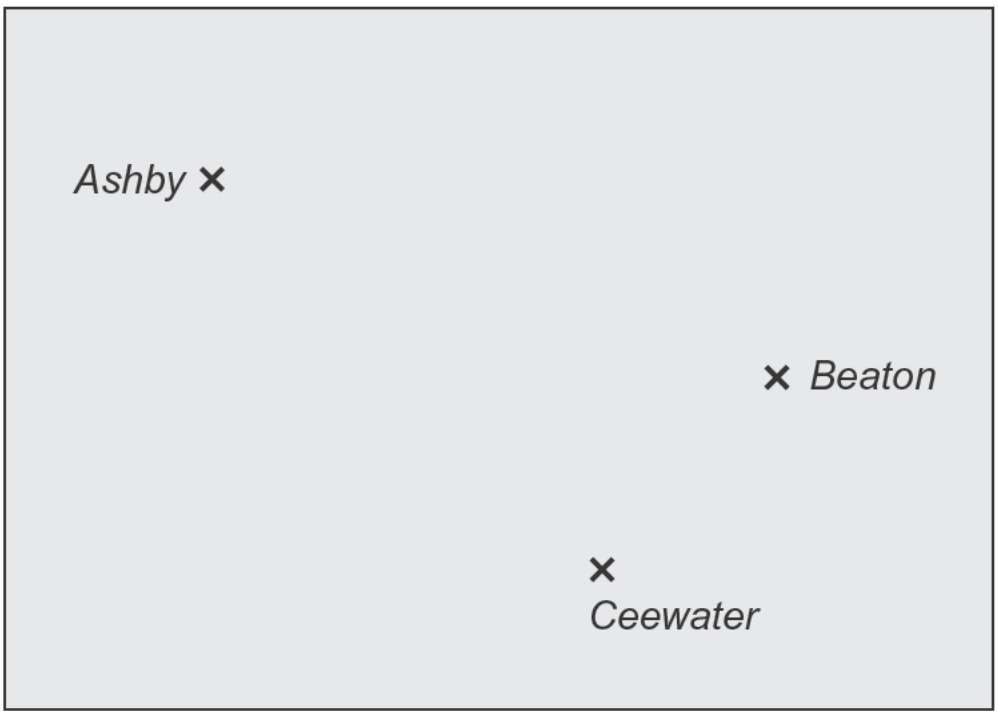
(d) **Estimate** the answer to $\dfrac{28.6 \times 24.4}{5.67 \times 4.02}$

. . . . . .

. . . .
1 mark

12. The plan shows the position of three towns, each marked with a ×

The scale of the plan is **1 cm to 10 km**.



The towns need a new radio mast.

The new radio mast must be:

nearer to Ashby than Ceewater, and
less than 45 km from Beaton.

Show on the plan the region where the new radio mast can be placed.

Leave in your construction lines.

. . . .

. . . .

. . . .

3 marks

13. (a) Two of the expressions below are **equivalent**.

Circle them.

$5(2y + 4)$ $5(2y + 20)$ $7(y + 9)$

$10(y + 9)$ $2(5y + 10)$

. . . .
1 mark

(b) One of the expressions below is **not** a correct factorisation of $12y + 24$

Which one is it? Put a cross (✘) through it.

$12(y + 2)$ $3(4y + 8)$ $2(6y + 12)$

$12(y + 24)$ $6(2y + 4)$

. . . .
1 mark

(c) Factorise this expression.

$7y + 14$ . . . . . .

. . . .
1 mark

(d) Factorise this expression as fully as possible.

$6y^3 - 2y^2$ . . . . . .

. . . .

. . . .
2 marks

14. Look at these number cards.

(a) Choose two of the cards to give the **lowest possible answer**.
Fill in the cards below and work out the answer.

☐ × ☐ = ...

2 marks

(b) Choose two of the cards to give the answer **100**

☐ ÷ ☐ = 100 . . . . .

1 mark

15. (a) Look at these cards.

You can see two of the expressions. The third is hidden.

$3x - 10$	$3x$	?

The **mean** value of the expressions is $\mathbf{3}x$

What is the hidden expression?

. . . .

1 mark

(b) Write a set of three expressions that has a mean value of $\mathbf{4}x$

. . . .

1 mark

(c) What is the mean value of these three expressions?

$2x + 3$	$5x - 9$	$5x + 12$

Show your working.

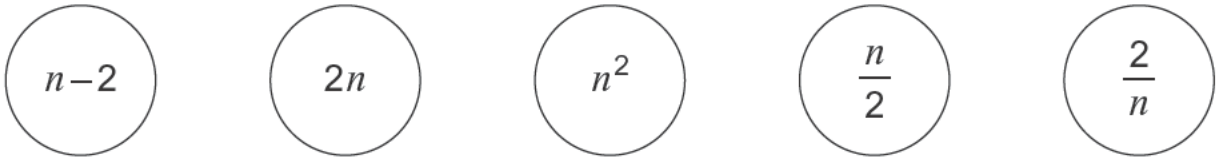
Write your expression as simply as possible.

. . . .

. . . .

2 marks

16. Look at these expressions.



(a) Which expression gives the greatest value when n is **between 1 and 2**?

1 mark

(b) Which expression gives the greatest value when n is **between 0 and 1**?

1 mark

(c) Which expression gives the greatest value when n is **negative**?

1 mark