Cambridge Assessment International Education

Cambridge Lower Secondary Checkpoint

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

5196528265

MATHEMATICS **0862/02**

Paper 2 **October 2023**

1 hour

You must answer on the question paper.

You will need: Geometrical instruments
Tracing paper (optional)

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You should show all your working in the booklet.
- You may use a calculator.

INFORMATION

- The total mark for this paper is 50.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **16** pages.

IB23 10_0862_02/6RP

1 Draw a ring around the sum of the exterior angles of an equilateral triangle.

120° 180° 360° 900°

[1]

2 Draw a ring around the unit that would be most suitable for measuring the mass of a ship.

light year megabyte microgram tonne

[1]

3 Mia says,'y is 3 more than x squared'.

Write down a formula for y in terms of x.

$y =$ $3 + x^2$ [1]

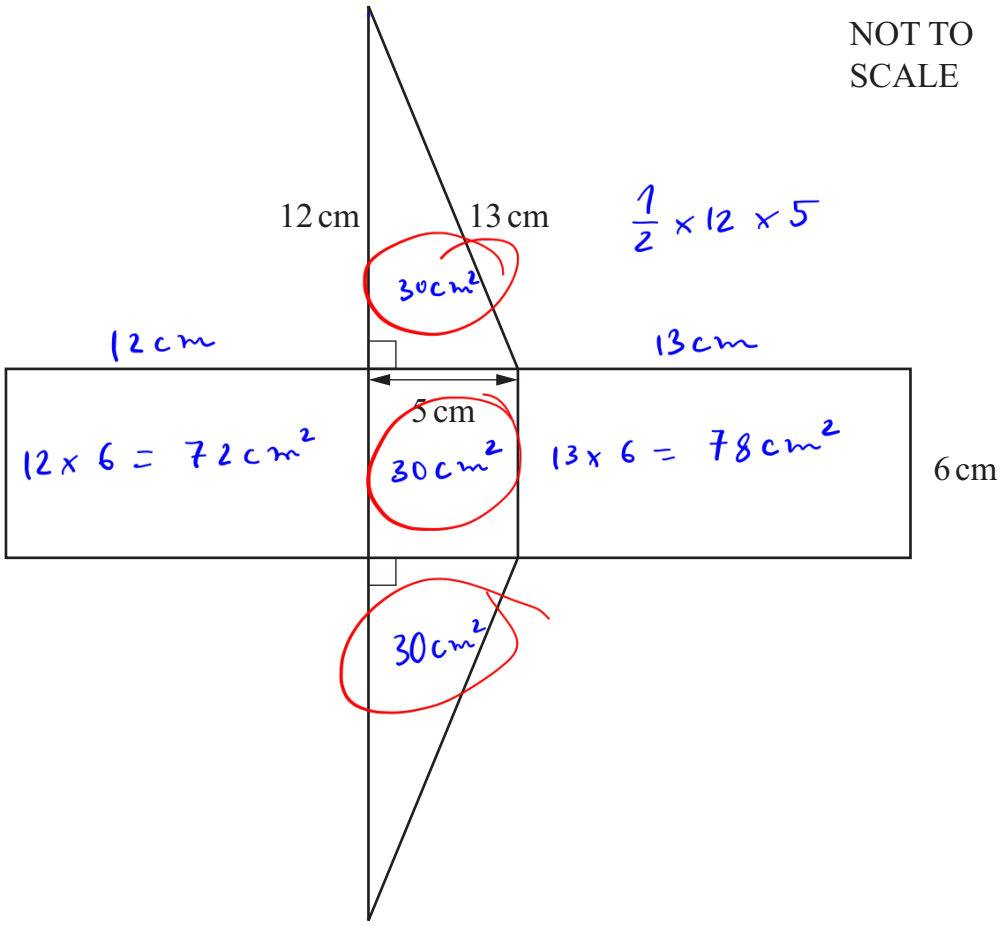
4 Here are the first five terms of a sequence.

11, 14, 19, 26, 35, 46, 59 (+3, +5, +7, +9, +11, +13)

Find the next two terms in the sequence.

46 and 59 [2]

5 Here is the net of a triangular prism.
It is formed from three rectangles and two right-angled triangles.

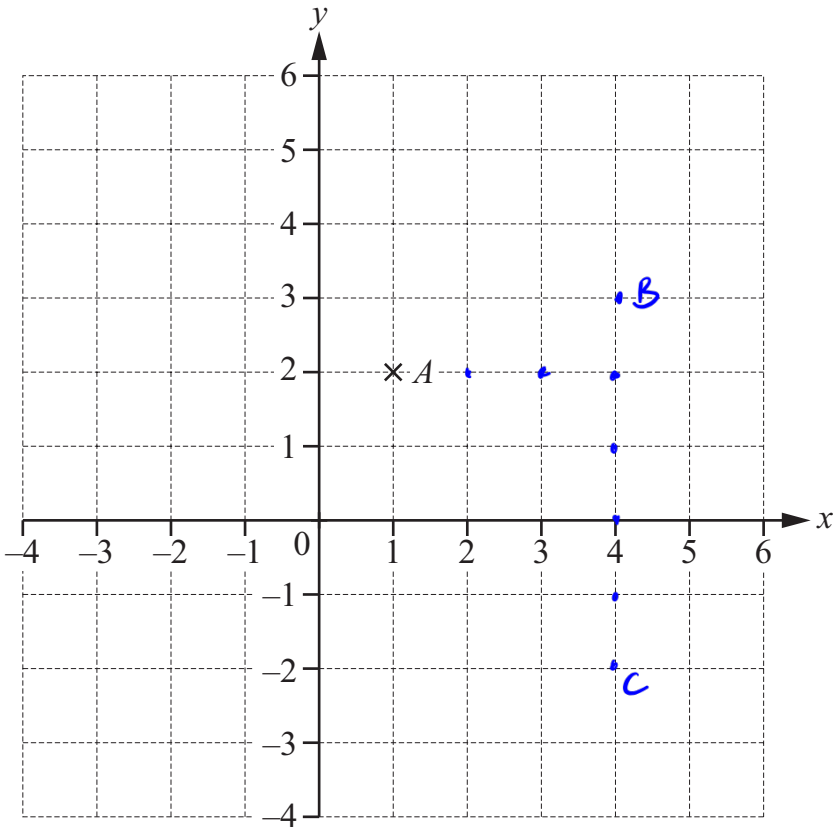


Tick (✓) to show if each of these facts about the faces of the triangular prism is true or false.

	True	False
Three faces have the same area.	✓	
The area of the largest face is 72 cm^2.		✓

[1]

6 Point A has coordinates (1, 2).



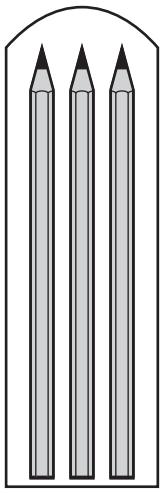
Point A is first translated by vector $\begin{pmatrix} 3 \\ 1 \end{pmatrix}$ to give point B.

Point B is then translated by vector $\begin{pmatrix} 0 \\ -5 \end{pmatrix}$ to give point C.

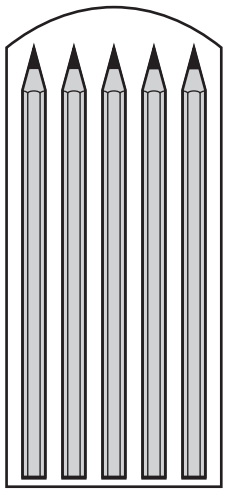
Find the coordinates of point C.

(4 , −2) [2]

7 Pencils can be bought in small packets or large packets.



small packet has 3 pencils



large packet has 5 pencils

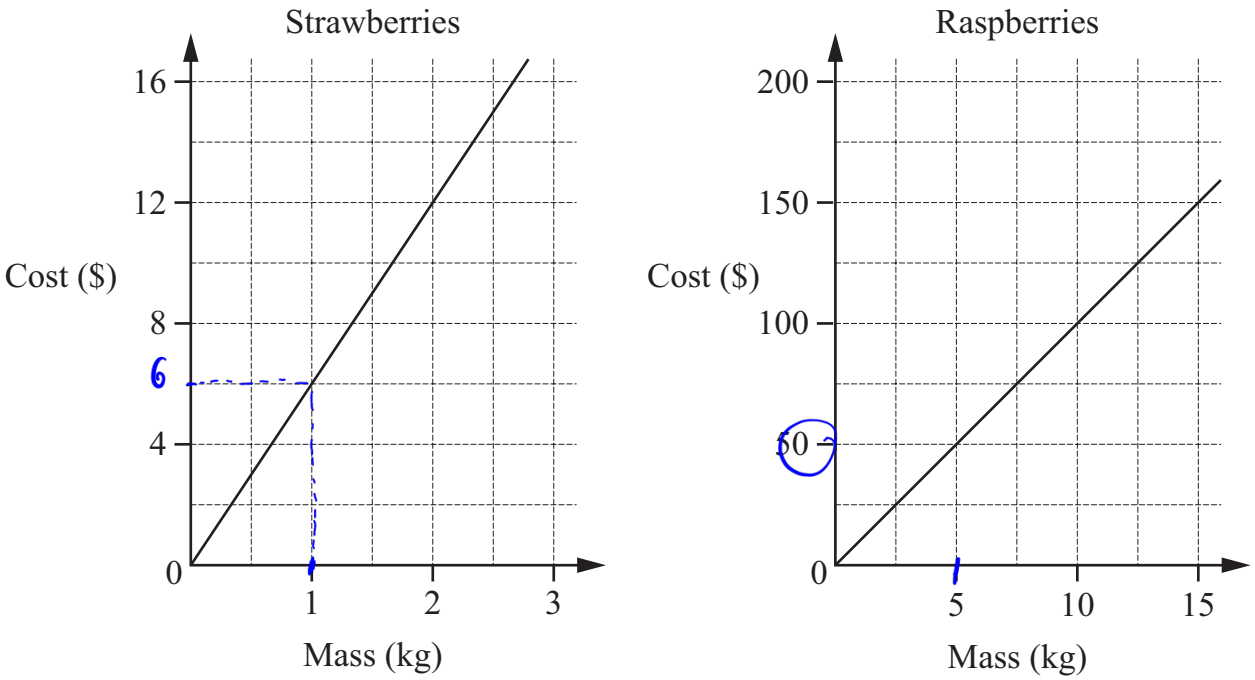
Mike buys m small packets and n large packets.
Altogether he buys 86 pencils.

Draw a ring around the equation that represents this situation.

$3m + 5n = 86$ $\quad m + n = 86$ $\quad 8(m + n) = 86$ $\quad 5m + 3n = 86$

[1]

8 The graphs show the costs, in $, of different masses of strawberries and raspberries.



Find how much more 1 kg of raspberries costs than 1 kg of strawberries.

$\$50 \div 5 = \$10$

$\$6$

$10 - 6 = 4$

$ 4 [2]

9 It will take 5 workers 12 days to harvest some apples.

Calculate how many workers are needed to harvest these apples in 4 days.

$5 \times 3 = 15$

15 [1]

10 Complete each statement to make it true.

$$\frac{8}{4x} = \frac{\boxed{2}}{x}$$

$$y^{11} \times \boxed{y} = y^{12}$$

$$\left(\boxed{w^5}\right)^2 = w^{10} \quad = (w^5)^2$$

[3]

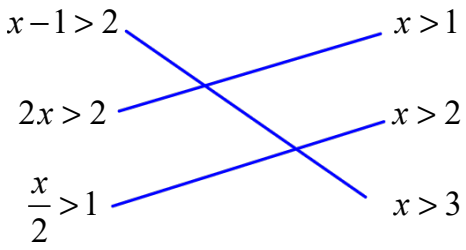
11 A train company says the probability that a train arrives at a station on time is 0.85
Ahmed selects a random sample of 80 trains arriving at this station.

Calculate the expected number of these trains that will arrive at this station on time.

$0.85 \times 80 =$

..... 68 ..... [1]

12 **(a)** Draw lines to match the equivalent inequalities.



[1]

(b) Solve the inequality.

$$11 - 2x \leq 20$$

$-2x \leq 20 - 11$

$-2x \leq 9$

$x \geq \frac{9}{-2}$

..... $x \geq \frac{-9}{2}$ ..... [2]

13 Here are the coordinates of four points.

$A(4, -6)$ $B(-4, 5)$ $C(-3, -2)$ $D(-3, 2)$

Tick (✓) to show if the midpoint of each line segment is above, on or below the x-axis.

Line segment	Above x-axis	On x-axis	Below x-axis
AB $\left(0, -\frac{1}{2}\right)$	☐	☐	✓
CD $(-3, 0)$	☐	✓	☐

[1]

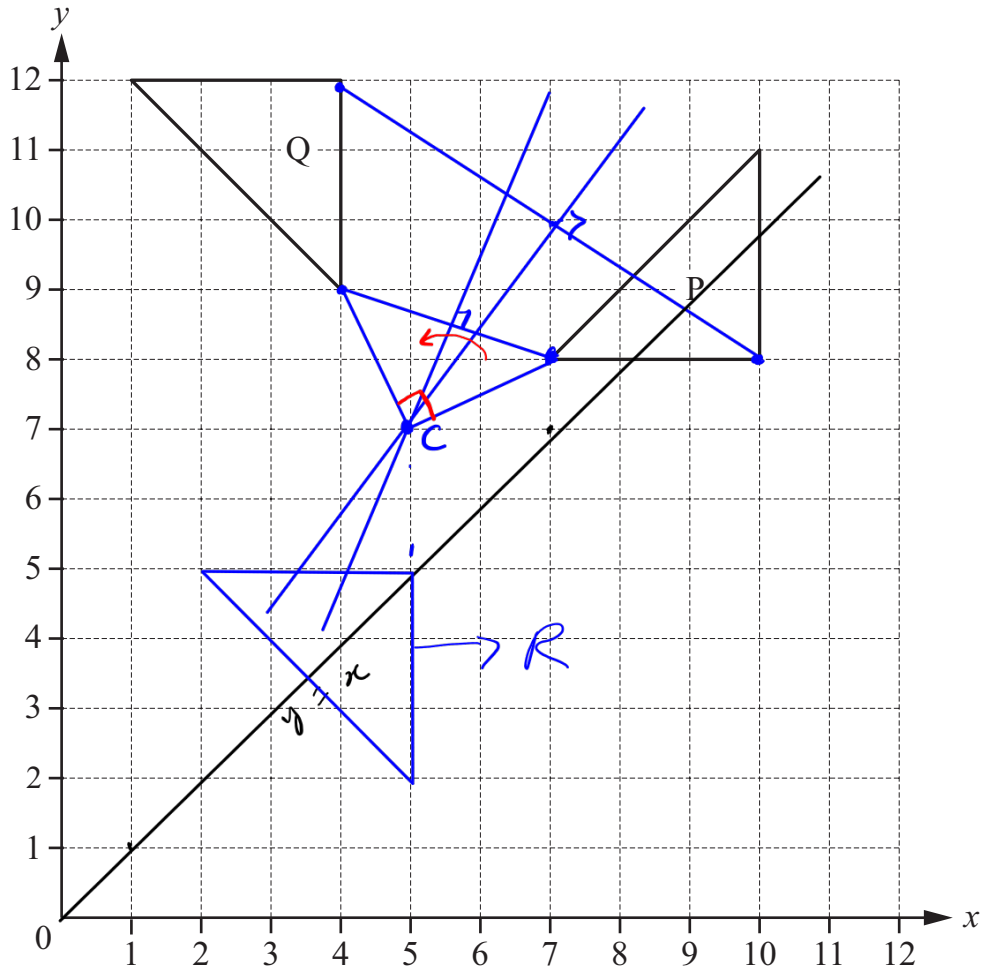
14 When 80 is increased by a% the result is between 105 and 110
a is a multiple of 4

Find a possible value of a.

$$105 < 80 + 80 \times a\% < 110$$
$$25 < 80 \times \frac{a}{100} < 30$$
$$25 < \frac{4a}{5} < 30$$
$$75 < 4a < 150$$
$$18.75 < a < 37.5$$

$a =$ 20 [1]

15 The grid shows the positions of triangle P and triangle Q.



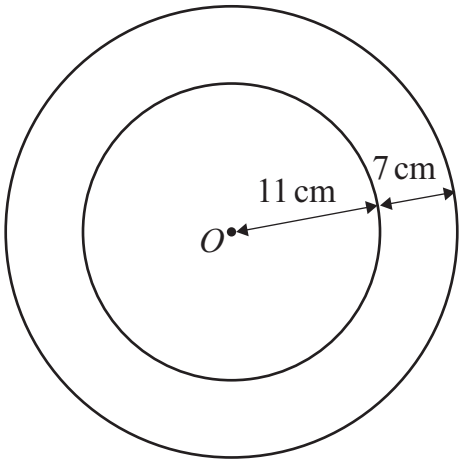
(a) Describe fully the **single** transformation that maps triangle P onto triangle Q.

Rotation around the point (5, 7), 90° anticlockwise [3]

(b) Triangle R is congruent to triangle P.
Triangle R maps onto itself when it is reflected in the line $y = x$.

Draw a possible position for triangle R on the grid. [1]

16 The diagram shows two circles, each with centre O.



NOT TO SCALE

Show that the circumference of the larger circle is approximately 44 cm more than the circumference of the smaller circle.

C_{small} : $2\pi \times 11 = 22\pi$ (cm)

C_{large} : $2\pi \times (11 + 7) = 36\pi$ (cm)

$36\pi - 22\pi = 14\pi \approx 44$

[2]

17 The table shows information about the ages of 100 runners.

mid point	Age (A, years)	Frequency
25	$20 \leq A < 30$	34
35	$30 \leq A < 40$	18
45	$40 \leq A < 50$	28
55	$50 \leq A < 60$	20

Calculate an estimate of the mean age of these runners.

mean $= \dfrac{25 \times 34 + 35 \times 18 + 45 \times 28 + 55 \times 20}{100} = 38.4$

..... 38.4 ..... years [3]

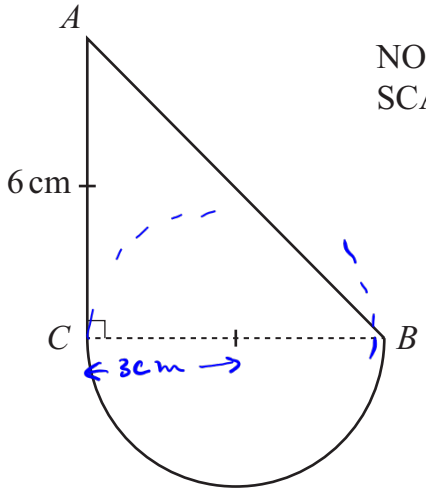
18 A teacher asks three students to state the equations of two lines with a **positive** gradient.

Tick (✓) to show if each student's answer is correct.

	Answer is correct
Chen $y = x + 8$ $y = 2x - 3$	✓
Eva $y = 4 - x$ $y = 7 - 2x$	
Lily $y = 3x$ $y = \frac{1}{2}x$	✓

[1]

19 A shape is formed from
a right-angled triangle ABC
and
a semicircle with diameter CB.



$AC = CB = 6$ cm.

πr^2

(a) Find the area of the whole shape.

Area $\triangle$ $= \frac{1}{2} \times AC \times CB = \frac{1}{2} \times 6 \times 6 = 18$

Area $\cup$ $= \frac{\pi \times 3^2}{2} = 4.5\pi$

Total area : $18 + 4.5\pi = 32$

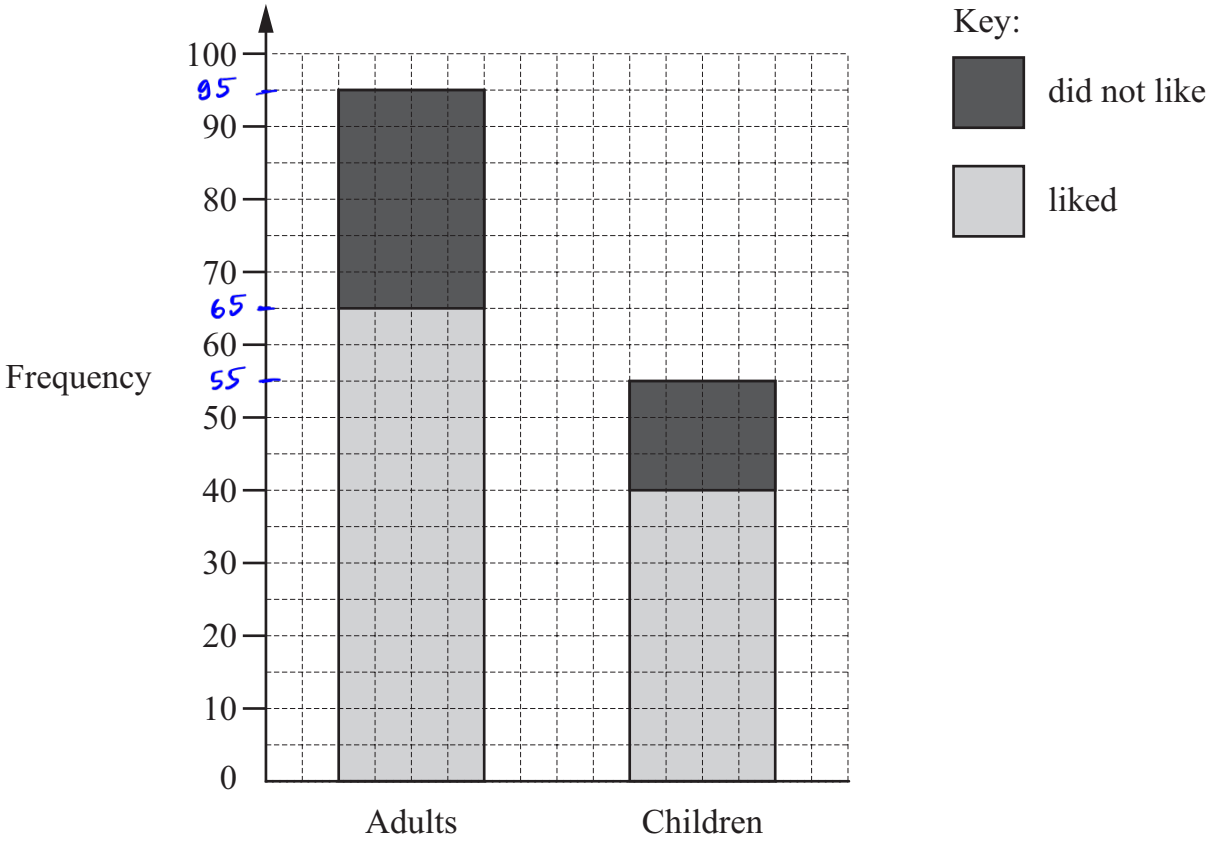
.....32..... cm^2 [3]

(b) Calculate the length of AB.

$AB = \sqrt{AC^2 + CB^2} = \sqrt{6^2 + 6^2} = 6\sqrt{2}$

.....$6\sqrt{2}$..... cm [2]

20 Anastasia asks the audience of a film if they liked it or did not like it.
The compound bar chart shows her results.



Show that 30% of people in the audience **did not like** the film.

The number of adults didn't like the film: 95 − 65 = 30
children: 55 − 40 = 15

$$\frac{30 + 15}{95 + 55} \times 100\% = 30\%$$

[2]

21 **(a)** The distance between two cities is 17 000 km correct to the nearest 1000 km.

Complete the inequality to show the limits of the distance.

$17000 + \frac{1000}{2}$

16 500 km ≤ distance < 17500 km

[1]

0.01

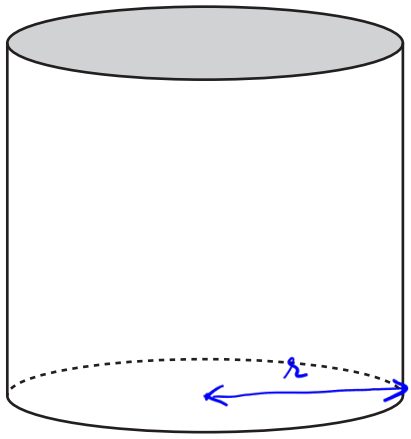
(b) The mass of a bag is 1.00 kg correct to 2 decimal places.

Find the lower limit of the mass.

$1 - \frac{0.01}{2} = 0.995$

0.995 kg [1]

22 A solid cylinder has a height of 18 cm.



NOT TO SCALE

The curved surface area of the cylinder is 845 cm^2.

Find the area of the top of the cylinder.

$\text{Circumference} = \frac{845}{18} = 47$

$r = \frac{47}{2\pi} = 7.48$

$\text{Area} = \pi (7.48)^2 = 176$

176 cm^2 [3]

23 Find the values of the integers a and b when

$$(x-5)(x+5)+ax=(x-3)(x+12)+b$$

$x^2 - 5x + 5x - 25 + ax = x^2 - 3x + 12x - 36 + b$

$x^2 + ax - 25 = x^2 + 9x + b - 36$

$\begin{cases} a = 9 \\ -25 = b - 36 \end{cases}$

$\begin{cases} a = 9 \\ b = 11 \end{cases}$

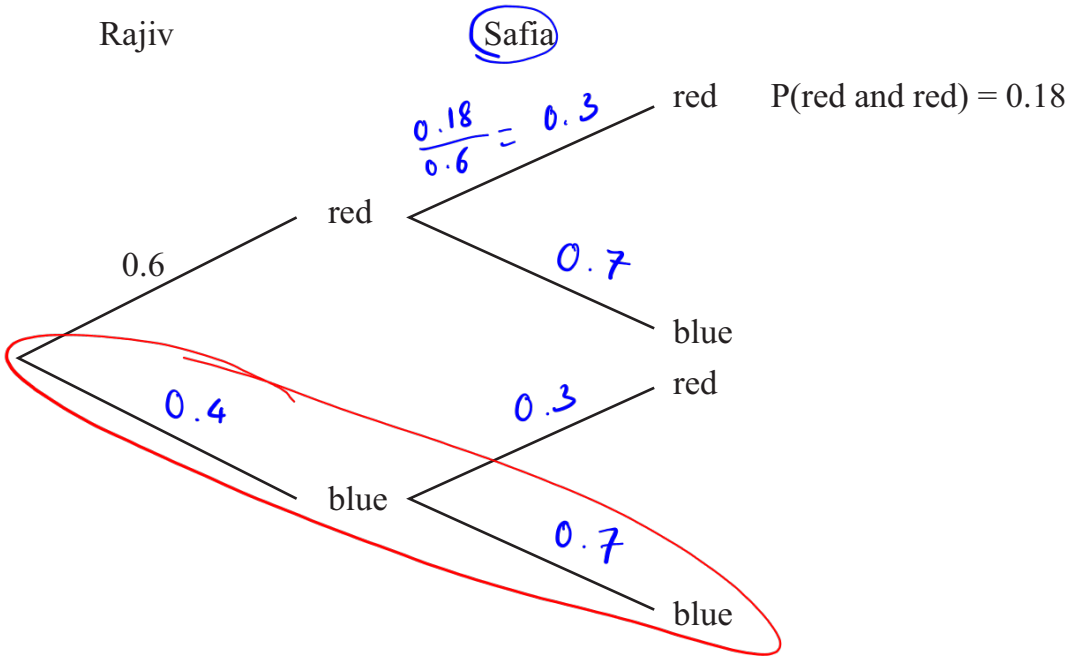
$a =$ 9

$b =$ 11

[3]

24 Rajiv has a bag containing only red counters and blue counters.
Safia has a different bag containing only red counters and blue counters.
They each take one counter at random from their bag.

The probability that Rajiv picks a red counter from his bag is 0.6
The probability that they **both** pick a red counter is 0.18



Find the probability that they both pick a **blue** counter.
You may use the tree diagram to help you.

$0.4 \times 0.7 = 0.28$

0.28 [4]