JP Maths Revision

Based on Edexcel GCSE (9-1)

📹 Attempt the paper before watching the solutions https://www.youtube.com/@JPMathsRevision

June 2026 Predicted Paper

Time: 1 hour 30 minutes

Mathematics

PAPER 2 (Calculator)

Higher Tier

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- You must **show all your working.**
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

Information

- The marks for **each** question are shown in brackets- *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages of your working.

1. (a) Expand and simplify $3(3x + 2) + 3(2x - 9)$

$9x + 6 + 6x - 27$

$15x - 21$

$15x - 21$

(2)

(b) Factorise fully $5xy - 10xy^2$

$5xy(1 - 2y)$

(2)

(c) $y = 3x - 4$. Find the value of y when $x = 5$.

$y = 3(5) - 4$

$= 11$

11

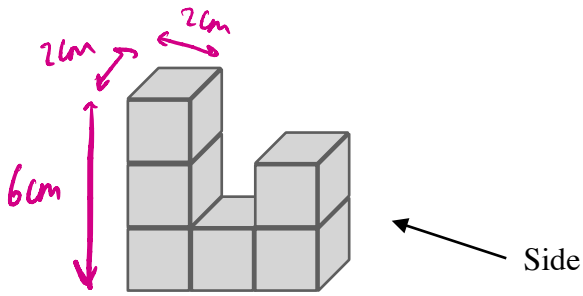
(1)

(Total for Question 1 is 5 marks)

2. A solid is made by stacking identical cubes each with side length 2 cm.

The diagram shows the solid.

On the centimetre grid below, draw an accurate plan and side elevation of the solid.



Plan

Side elevation

(Total for Question 2 is 4 marks)

3. A shop sells orange juice in two different sizes.

- Bottle A: 750 ml for £1.80
- Bottle B: 1.2 litres for £2.40

Which bottle is the better value for money?

You must show your working.

(A)

750ml = £1.80

1ml = £0.0024

(B)

1·2 litres = £2·40

1200 ml = £2·40

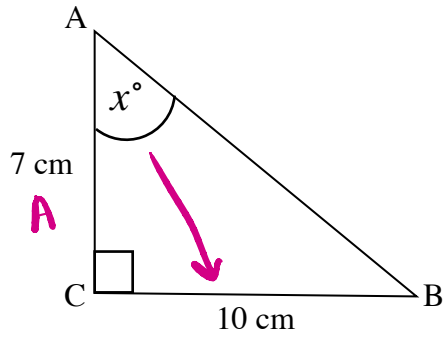
1 = £0·0020

0·0020 < 0·0024

B

(Total for Question 3 is 3 marks)

4. In triangle ABC, AB = 7 cm and BC = 10 cm. Find the size of angle BAC.



A

C

B

$\tan x = \frac{10}{7}$

$x = \tan^{-1}\left(\frac{10}{7}\right)$

$= 55°$

55 °

(Total for Question 4 is 3 marks)

5. Alex and Ben share some money in the ratio 3 : 5.

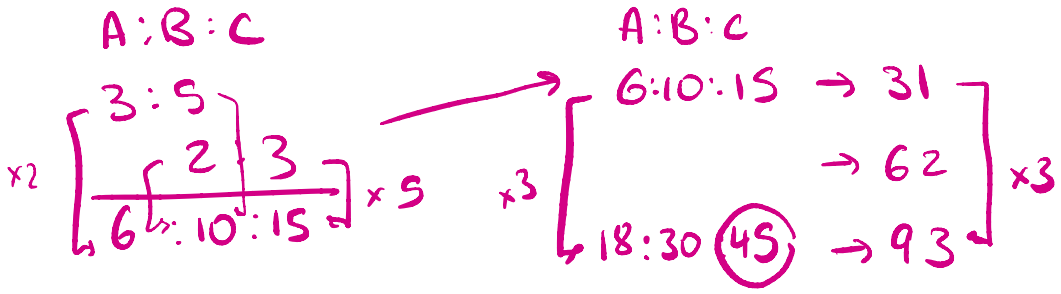
Ben and Charlie share the same amount of money in the ratio 2 : 3.

Between the three of them, they share less than £100.

What is the greatest amount of money Charlie received?

A:B
3:5

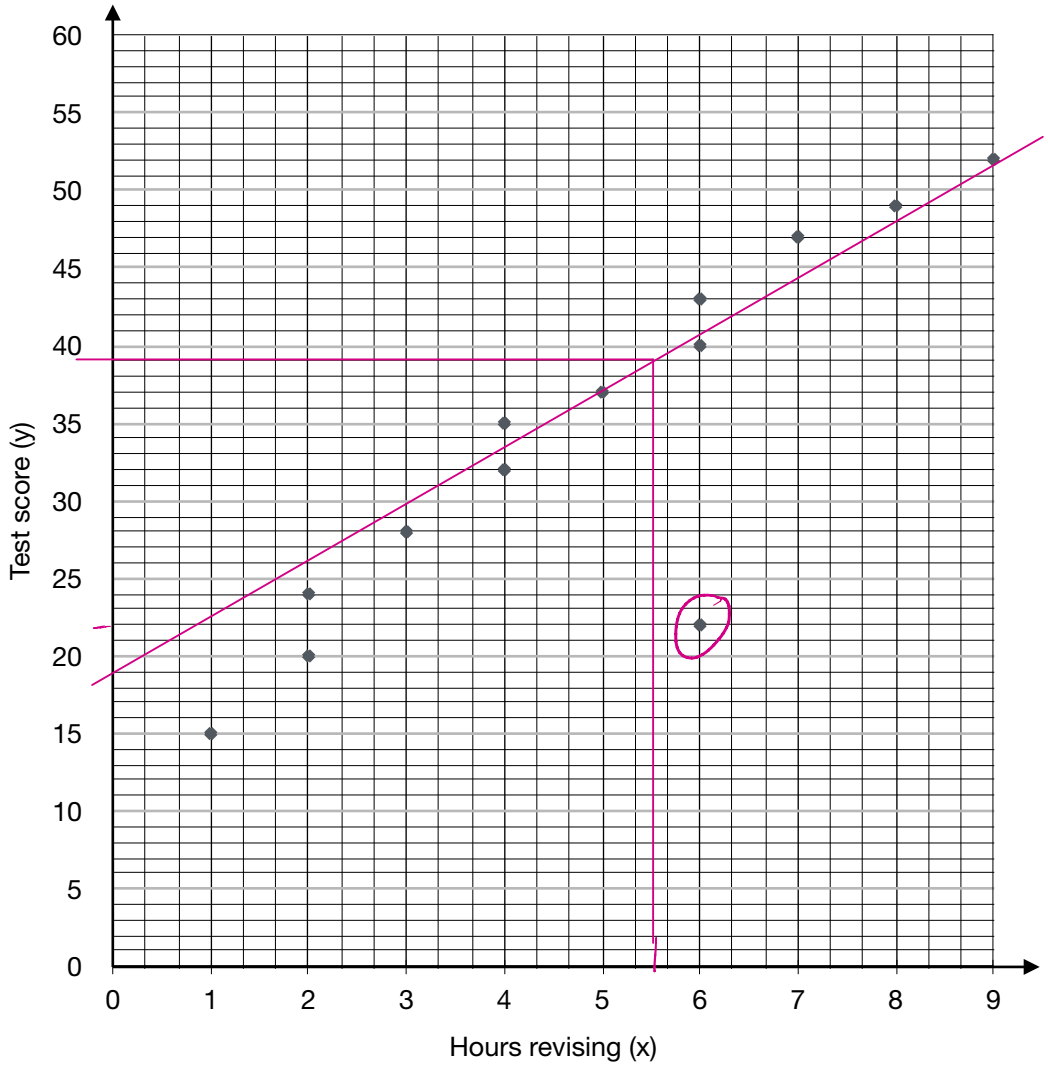
B:C
2:3



£ 45

(Total for Question 5 is 3 marks)

6. The scatter graph shows the number of hours spent revising by 13 students and the marks they got in a test.



(a) One of the points is an outlier. Write down the coordinates of this point.

(6 , 22)

.....

(1)

(b) Ignoring the outlier, describe the relationship between the number of hours spent revising and the test score achieved by the students.

More hours revising leads to higher test scores

.....

.....

(1)

(c) Another student spends 5.5 hours revising. Use the scatter graph to predict their test score.

39

(2)

(d) Matthew wants to use the graph to predict what his test score might be if he spends 12 hours revising. Explain why this estimate may not be reliable.

12 hours is outside the range of data.

(1)

(Total for Question 6 is 5 marks)

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7. A recipe requires 250 g of butter to make 8 identical cupcakes.

Sam has 120 g of butter, correct to the nearest 5 g.

Sam says, "I might have enough butter to make 4 cupcakes."

Is Sam correct?
You must show your working.

120g → LB = 117.5, UB = 122.5

Sam has between 117.5 and 122.5g butter.

4 cupcake requires 250 ÷ 2 = 125g butter

So no, Sam is not correct

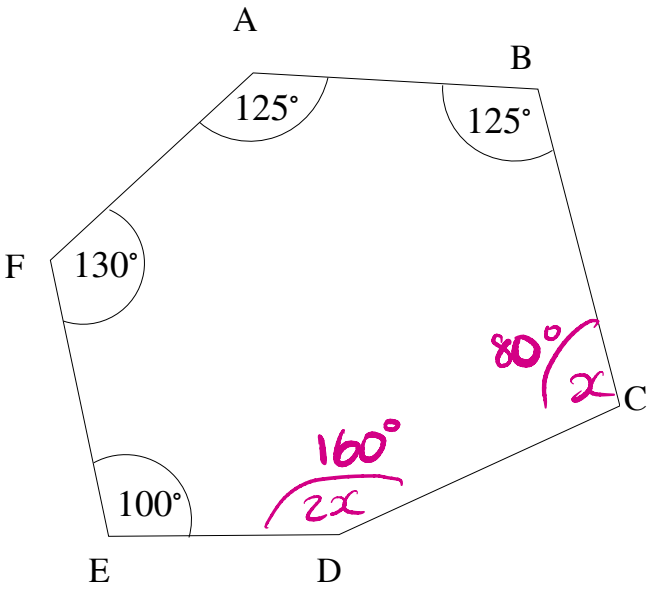
(Total for Question 7 is 3 marks)

8. The diagram shows hexagon ABCDEF.

Angle BCD and CDE are in the ratio 1:2.

Find the size of the angle CDE.

You must show all your working.



$(6-2)\times 180$

$= 720°$

$125+125+130+100+2x+x = 720$

$3x + 480 = 720$

$3x = 240$

$x = 80$

160 °

(Total for Question 8 is 4 marks)

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9. A calculator displays the value of a number as 3.47. This value has been truncated to 2 decimal places.

Write down the error interval for the number.

1.47 $\leq x <$ 1.48

(Total for Question 9 is 2 marks)

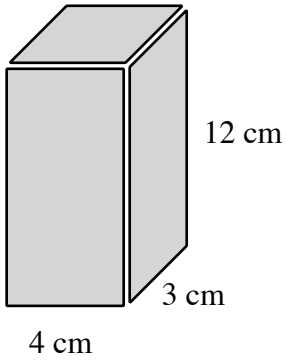
10. A drinks carton is in the shape of a cuboid with dimensions 3cm, 4cm and 12cm.

Liquid is poured into the carton at a constant rate of 18 cm^3 per second.

The carton is filled until it is $\frac{5}{6}$ full.

Find the time it takes to reach this level.

Give your answer to the nearest second.



Volume = $3 \times 4 \times 12 = 144 cm^3$

$\frac{5}{6}$ of $144 = 120$

$120 \div 18 = 6667$

7 .....Seconds

(Total for Question 10 is 4 marks)

11. Expand and simplify $(x + 1)(x + 2)^2$

$(x+1)(x+2)(x+2)$

$(x^2+3x+2)(x+2)$

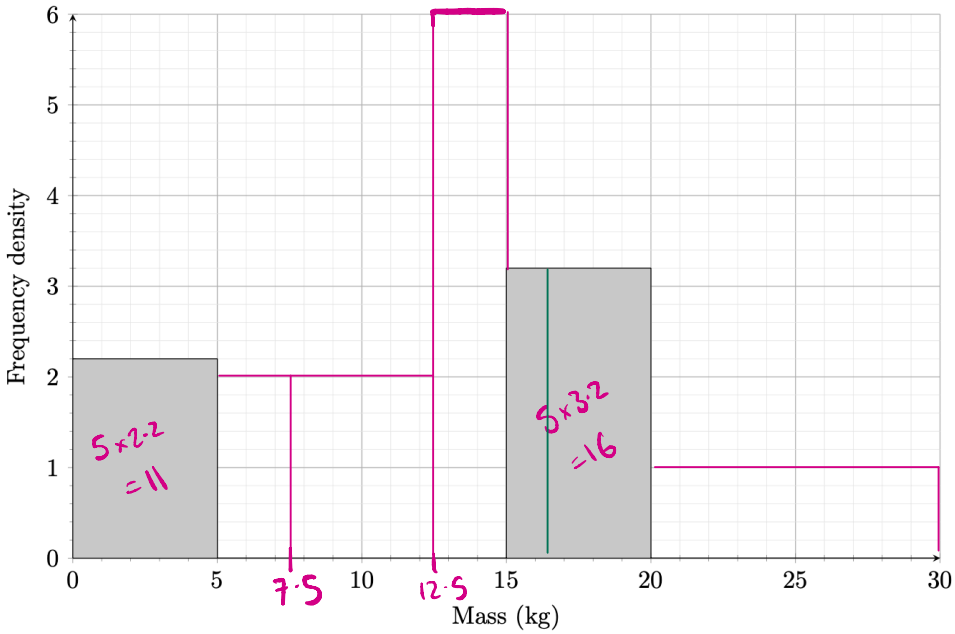
$x^3+2x^2+3x^2+6x+2x+4$

x^3+5x^2+8x+4

(Total for Question 11 is 3 marks)

12. The incomplete table and histogram give information about the masses of some parcels.

Mass (x kg)	Frequency	Frequency density
$0 < x \leq 5$	11	$11 \div 5 = 2.2$
$5 < x \leq 7.5$	5	$5 \div 2.5 = 2$
$7.5 < x \leq 12.5$	10	$10 \div 5 = 2$
$12.5 < x \leq 15$	15	$15 \div 2.5 = 6$
$15 < x \leq 20$	16	$16 \div 5 = 3.2$
$20 < x \leq 30$	10	$10 \div 10 = 1$



(a) Use the histogram to complete the table.

(2)

(b) Use the table to complete the histogram.

(2)

(c) Use the histogram to estimate the number of parcels between 12.5 kg and 16.5 kg.

$6 + 1.5 \times 3.2$

$= 10.8$

10.8

.....

(2)

(Total for Question 12 is 6 marks)

13. Simplify fully

$$\frac{2}{x+1}+\frac{3}{x-2}\div\frac{x+4}{(x+1)(x-2)}$$

$\frac{2}{x+1} + \frac{3}{x-2} \times \frac{(x+1)(x-2)}{x+4}$

$\frac{2}{x+1} + \frac{3(x+1)}{x+4}$

$\frac{2(x+4)}{(x+1)(x+4)} + \frac{3(x+1)(x+1)}{(x+1)(x+4)}$

$= \frac{2x+8+3(x^2+2x+1)}{(x+1)(x+4)}$

$= \frac{3x^2+8x+11}{(x+1)(x+4)} = \frac{3x^2+8x+11}{x^2+5x+4}$

$\frac{3x^2+8x+11}{x^2+5x+4}$

.....

(Total for Question 13 is 4 marks)

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14. The ratio $(x-3):(x+7)=y:2$

Show that $x=\frac{7y+6}{2-y}$

$\frac{x-3}{x+7} = \frac{y}{2}$

$2(x-3) = y(x+7)$

$2x-6 = xy+7y$

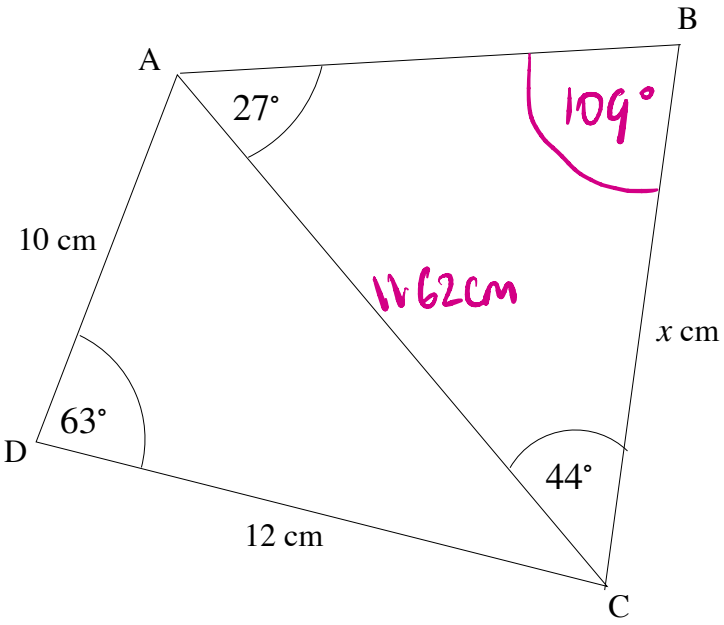
$2x-xy = 7y+6$

$x(2-y) = 7y+6$

$x = \frac{7y+6}{2-y}$

(Total for Question 14 is 4 marks)

15. ABC and ACD are triangles.



Calculate the length BC.

Give your answer to 3 significant figures.

$AC^2 = 10^2 + 12^2 - 2(10)(12)\cos(63)$

$\Rightarrow AC = \sqrt{ans} = 11.62\text{ cm}$

$$\frac{11.62}{\sin(109)} = \frac{x}{\sin(27)}$$

$$x = \frac{11.62}{\sin(109)} \times \sin(27)$$

$$= 5.579$$

5.58 cm

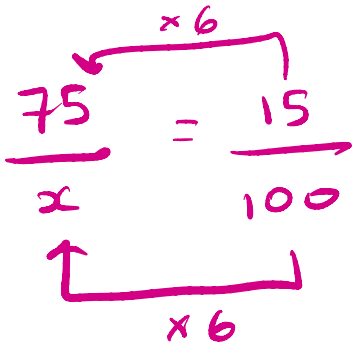
(Total for Question 15 is 4 marks)

16. A company wants to estimate how many hoodies are being sold at a music festival.

They secretly tag 75 hoodies on the first day.

The next day, they check 100 hoodies.
Of these, 15 are tagged.

(a) Estimate the total number of hoodies being sold.



600

(3)

(b) Give one assumption that must be true for this estimate to be reliable.

None of the tags fall off.

(1)

(Total for Question 16 is 3 marks)

17. A runner is training for a new fitness programme.

The runner's heart rate, x beats per second, after n minutes is estimated using the iteration formula

$x_{n+1} = \sqrt[3]{k - x_n}$ with $x_0 = 1.2$.

After 1 minute, the runner's heart rate is 1.3 beats per second.

Work out the runner's heart rate after 5 minutes.

$x_0 = 1.2$

$x_1 = \sqrt[3]{k-1.2} = 1.3$

$k - 1.2 = (1.3)^3$

$k = 1.2 + (1.3)^3$

$= 3.397$

$x_2 = \sqrt[3]{3.397 - 1.3} = 1.280$

$x_3 = \sqrt[3]{3.397 - 1.280} = 1.284$

$x_4 = \sqrt[3]{3.397 - 1.284} = 1.283$

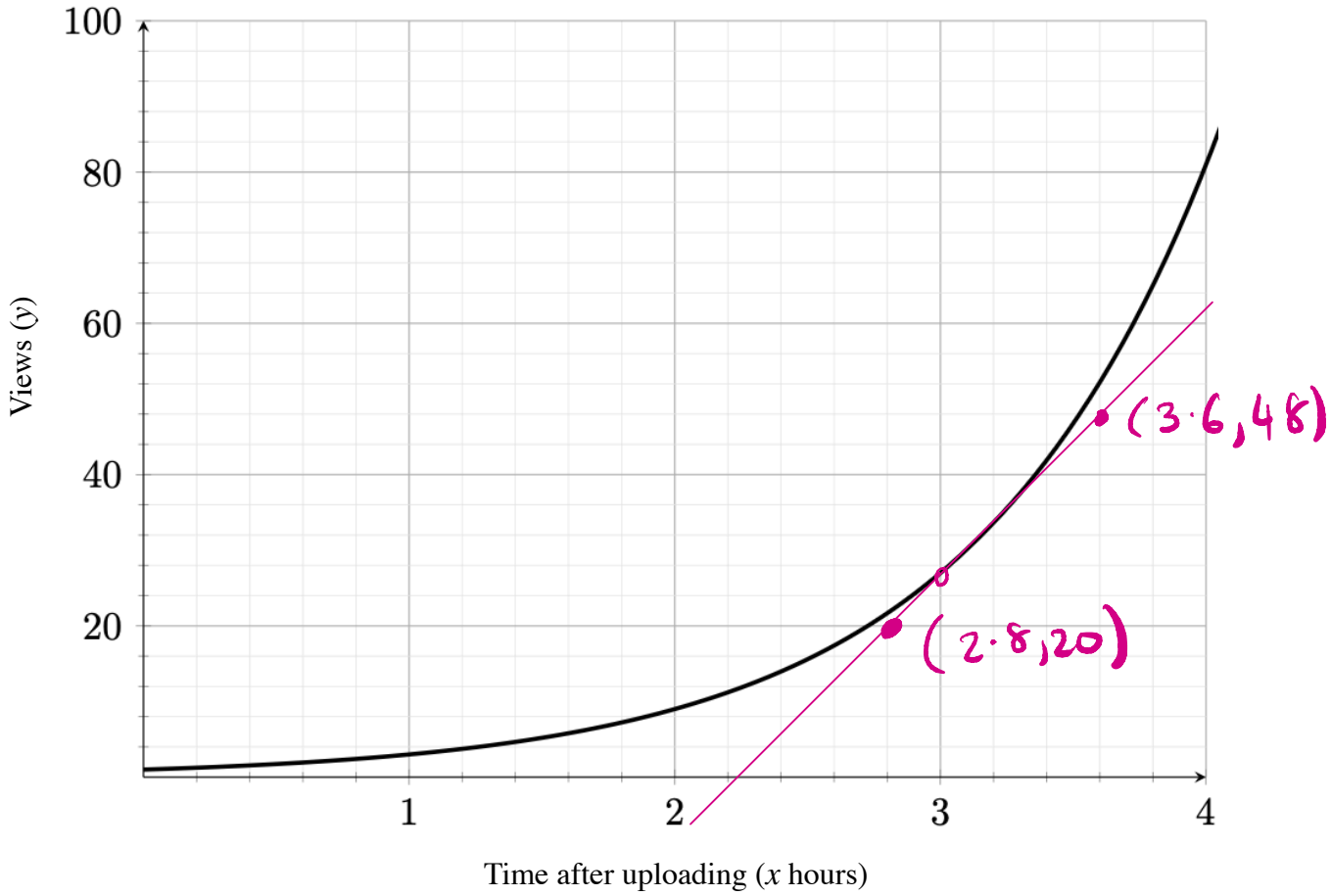
$x_5 = \sqrt[3]{3.397 - 1.283} = 1.283$

1.283 Beats per second

(Total for Question 17 is 5 marks)

18. A video is uploaded online.

The number of views, y, increases exponentially with time, x hours.



(a) Estimate the gradient of the curve at $x = 3$

$$\frac{48-20}{3.6-2.8} = \frac{28}{0.8} = 35$$

35

.....

(3)

(b) What does the gradient of the graph represent?

Rate that the views are increasing by per hour

.....

.....

(1)

(Total for Question 18 is 4 marks)

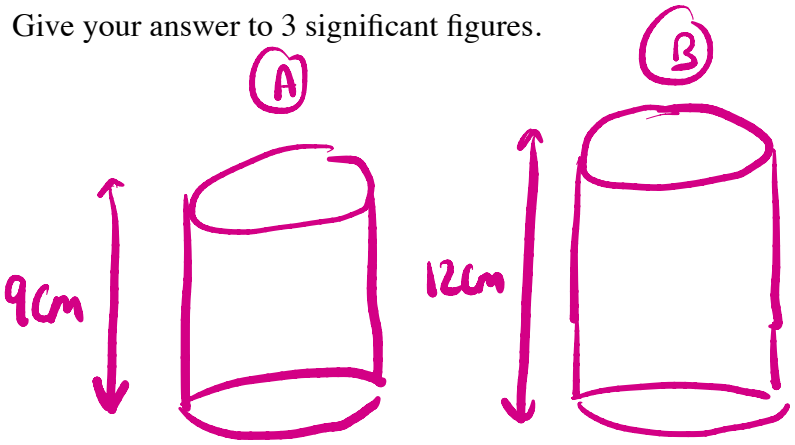
19. Two similar cylinders A and B have volumes in the ratio 27 : 64.

The height of cylinder A is 9 cm.

The total surface area of cylinder B is $256\pi\ cm^2$.

Find the radius of cylinder A.

Give your answer to 3 significant figures.



$V_A : V_B$

$27 : 64$

$\downarrow$

$l_A : l_B$

$3 : 4$

$\downarrow$

$A_A : A_B$

$9 : 16$

$l_A : l_B$

$\times 3 \left[\begin{matrix} 3 : 4 \\ 9 : 12 \end{matrix} \right] \times 3$

$A_A : A_B$

$16\pi \left[\begin{matrix} 9 : 16 \\ 144\pi : 256\pi \end{matrix} \right] \times 16\pi$

$SA = 2\pi r^2 + 2\pi rh$

$144\pi = 2\pi r^2 + 2\pi r(9)$

$144 = 2r^2 + 18r$

$72 = r^2 + 9r$

$r^2 + 9r - 72 = 0$

$r = \frac{-9 \pm \sqrt{9^2 - 4(1)(-72)}}{2(1)}$

$r = 5.10$

$r = -14.1$ X

5.10 .....cm

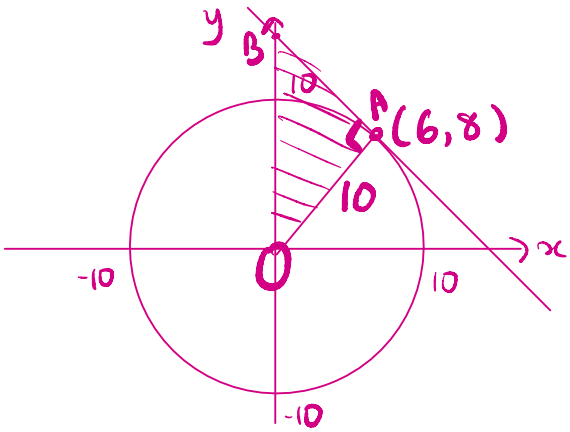
(Total for Question 19 is 5 marks)

20. A circle has equation $x^2 + y^2 = 100$.

The point A lies on the circle where $x = 6$ and $y > 0$.

The tangent to the circle at A intersects the y-axis at point B.

Find the area of triangle OAB, where O is the origin.



when $x = 6$

$6^2 + y^2 = 100$

$36 + y^2 = 100$

$y^2 = 64$

$y = 8$

Tangent

grad OA $= \frac{8-0}{6-0} = \frac{4}{3}$

grad tangent $= -\frac{3}{4}$

$y = -\frac{3}{4}x + c$

$8 = -\frac{3}{4}(6) + c$

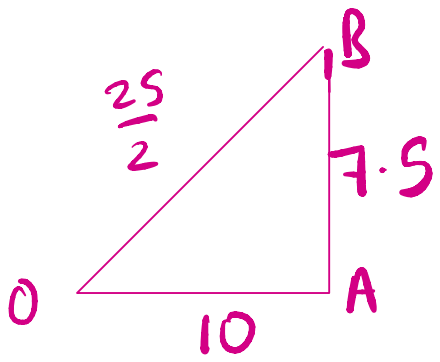
$8 = -\frac{18}{4} + c \Rightarrow c = 8 + \frac{18}{4} = \frac{50}{4} = \frac{25}{2}$

$$\boxed{y = -\frac{3}{4}x + \frac{25}{2}}$$

B is the y-intercept of tangent.

Since $y = -\frac{3}{4}x + \frac{25}{2}$

$B = \left(0, \frac{25}{2}\right)$



$AB = \sqrt{\left(\frac{25}{2}\right)^2 - 10^2}$

$= \sqrt{56.25}$

$= 7.5$

$\text{Area} = \frac{1}{2} \times 10 \times 7.5$

$= 37.5$

37.5

.....

(Total for Question 20 is 5 marks)

TOTAL FOR PAPER IS 80 MARKS