

Name: \_\_\_\_\_

GCSE Maths 2022  
AQA Higher Paper 2  
Set A  
Calculator



### Equipment

1. A black ink ball-point pen.
2. A pencil.
3. An eraser.
4. A ruler.
5. A pair of compasses.
6. A protractor.

### Guidance

1. Read each question carefully.
2. Check your answers seem right.
3. Always show your workings

### Information

1. This paper has been created based on topics in the Advance Information.
2. Also see Corbettmaths for the checklist for the entire GCSE as these topics may still be useful for Paper 2
3. There is one question per topic - this paper is designed to give an opportunity to practice each topic rather than replicate the actual paper.
4. The marks for questions are shown in brackets

GCSE 2022 Resources



1. Work out

$$1 \frac{2}{11} \times \frac{8}{9}$$

.....  
(2)

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2. Write down the reciprocal of 0.22

.....  
(1)

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3. Write 83.07718 correct to two decimal places.

.....  
(1)

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4. Write  $\frac{10}{64}$  as a percentage

.....  
(1)

5. (a) Write 1008 as a product of prime factors.  
Express your answer in index form.

.....  
(3)

- (b) Hence find the **least** number by which 1008 would need to be multiplied by to give a square number.

.....  
(1)

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6. (a)  $y^4 \times y^n = 1$

Work out the value of n

.....  
(1)

(b) Simplify fully  $\frac{a^8}{a^3 \times a^{-9}}$

.....  
(2)

7. (a) Write down the value of  $5^{-3}$

.....  
(1)

(b) Write down the value of  $36\frac{3}{2}$

.....  
(1)

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8. The population of a country at the beginning of 2011 was 4,380,000  
Over the next decade, the population increased by 7%

Work out the population at the beginning of 2021

.....  
(2)

9. Susan buys an antique for £120 and sells it for £216.

Work out her percentage profit

.....%  
**(2)**

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10. Bag A contains  $5x$  coins.  
Bag B contains  $3x$  coins.  
8 coins are taken from Bag B and put into Bag A  
The ratio of coins in Bag A to Bag B is now 11:5

Work out the total number of coins.

.....  
**(3)**

11. Miss Jones owns a factory that makes pens.  
She has received an order for a large quantity of pens and she knows if she used 8 machines, it would take 72 hours for enough pens to be made.

Miss Jones plans to start making pens at 8am on Monday with 2 machines.  
She can start using a third machine at 5pm on Tuesday.  
Finally 3 more machines will be free at 10am on Wednesday.

Approximately when will enough pens be made?

.....  
(4)

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12. Anthony measured the length and width of a rectangle.  
He measured the length to be 38cm correct to the nearest centimetre.  
He measured the width to be 30cm correct to the nearest 10 centimetres.

Calculate the lower bound for the area of this rectangle.

.....cm<sup>2</sup>  
(2)

13. (a) Expand and simplify  $(3y - 2)(y + 3)$

.....  
(2)

(b) Expand and simplify  $(y - 1)(y + 2)(y + 7)$

.....  
(2)

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14. (a) Solve  $m^2 + 24m + 63 = 0$

.....  
(2)

(b) Solve  $5y^2 + 8y - 100 = y^2 + 4y - 37$

.....  
(2)

15. The triangular numbers are 1, 3, 6, 10, ... ..  
The  $n$ th term of this sequence is  $\frac{1}{2}n(n + 1)$

Find the 200th triangular number

.....  
(2)

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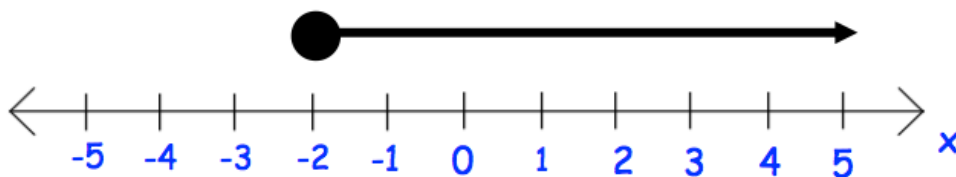
16. Harley is 8 years younger than India.  
Jessica is three times older than Harley.  
The sum of the three ages is 88.

Write the ratio of Jessica's age to India's age.

.....  
(4)

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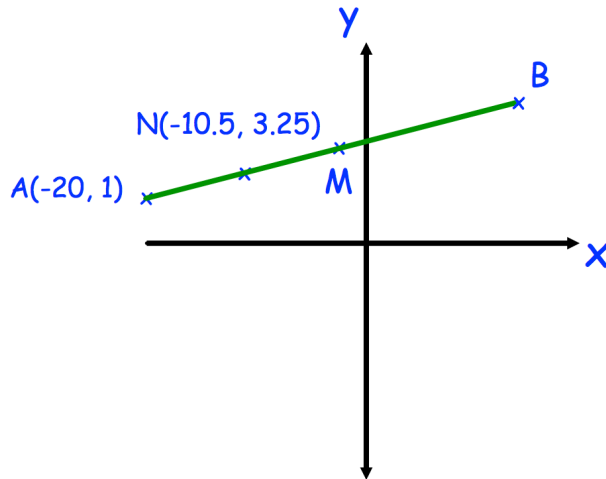
17. Write down the inequality shown by the diagram.



.....  
(1)



18.

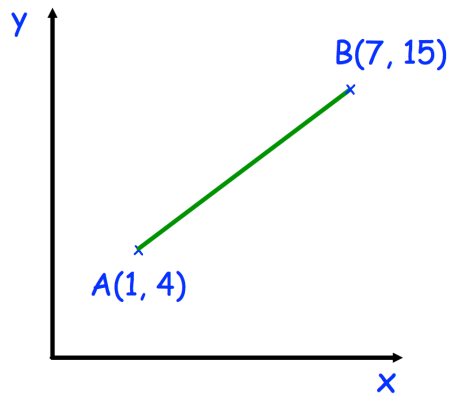


M is the midpoint of AB.  
N is the midpoint of AM.

Find the coordinates of the point B.

.....  
(4)

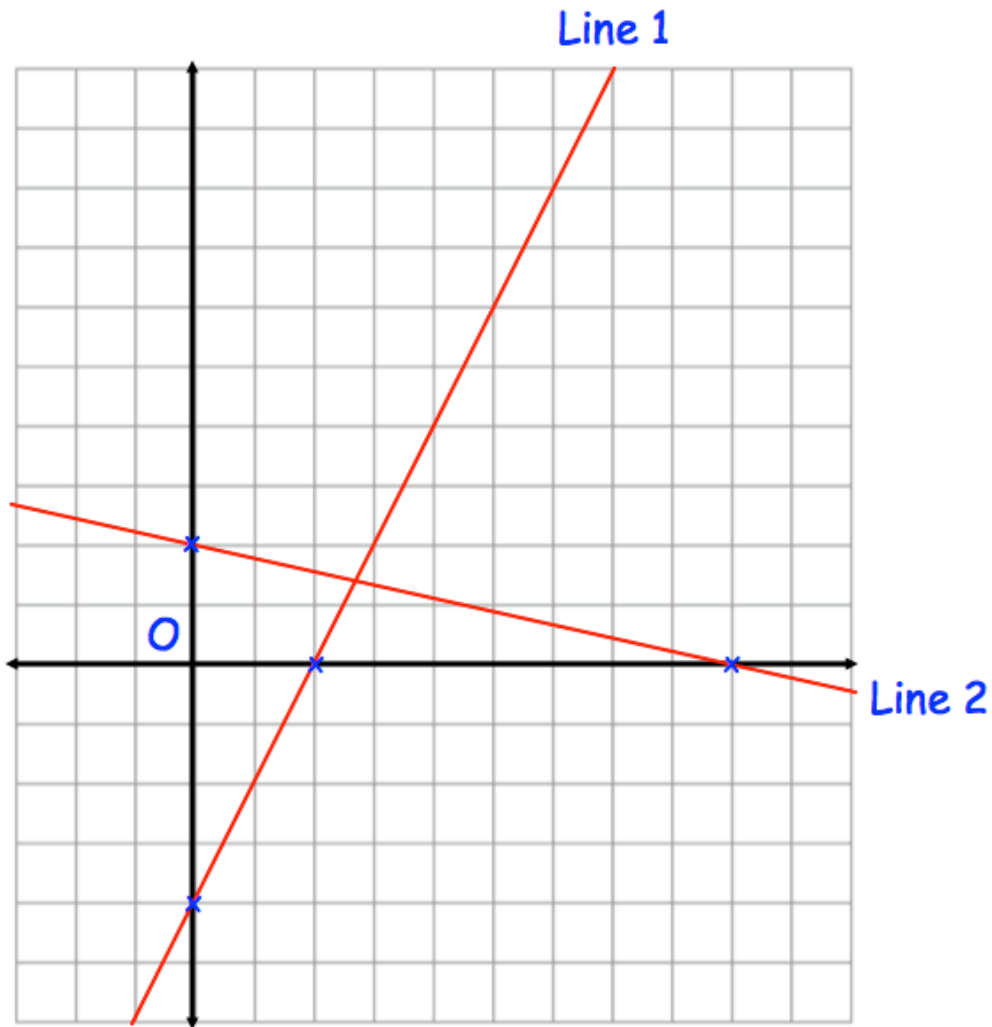
19. Shown below are the points A(1, 4) and B(7, 15)



Calculate the length of the line joining A and B.

.....  
(2)

20. Shown are two straight lines drawn on the grid.



Line 1 has equation  $y = 3x - 12$

(a) Find the equation of Line 2

.....  
(4)

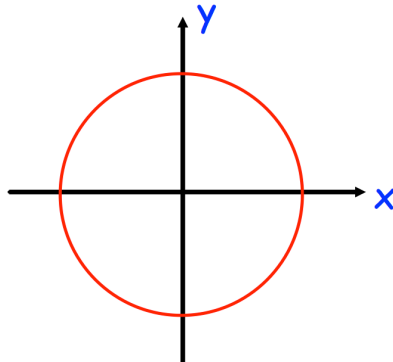
(b) Are the two lines perpendicular?  
Explain your answer.

.....  
.....  
(1)

21. The circle shown has  $x^2 + y^2 = 42.25$

Find the circumference of the circle.

Give your answer in terms of  $\pi$



.....  
(2)

22.

$$f(x) = \frac{3x}{5} + 1$$

(a) Find  $ff(2)$

.....  
(2)

(b) Find  $f^{-1}(350)$

.....  
(3)

23. Solve  $x^2 - x - 11 = 0$

Give your answers to 1 decimal place.

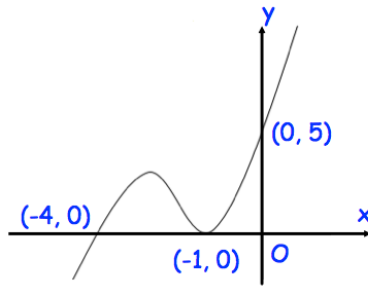
.....  
**(3)**

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24. Write  $x^2 + 10x + 7$  in the form  $(x + a)^2 + b$ , where  $a$  and  $b$  are constants.

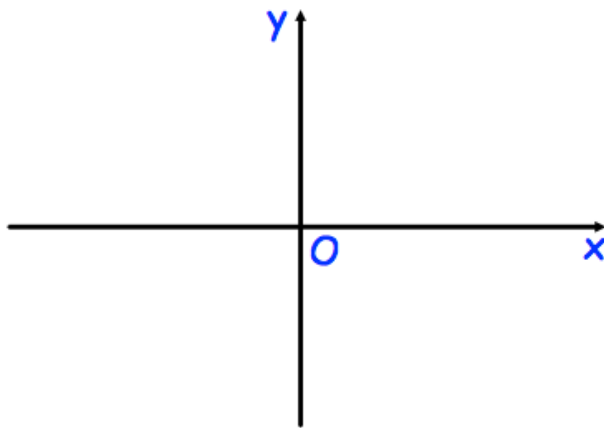
.....  
**(3)**

25. Shown below is the curve with equation  $y = f(x)$ .  
The curve passes through the points  $(-4, 0)$ ,  $(-1, 0)$  and  $(0, 5)$



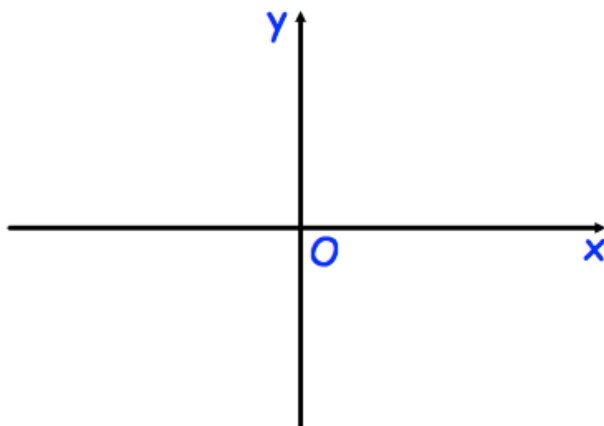
Sketch the curve with equation:

(a)  $y = f(x - 1)$



(2)

(b)  $y = f(-x)$

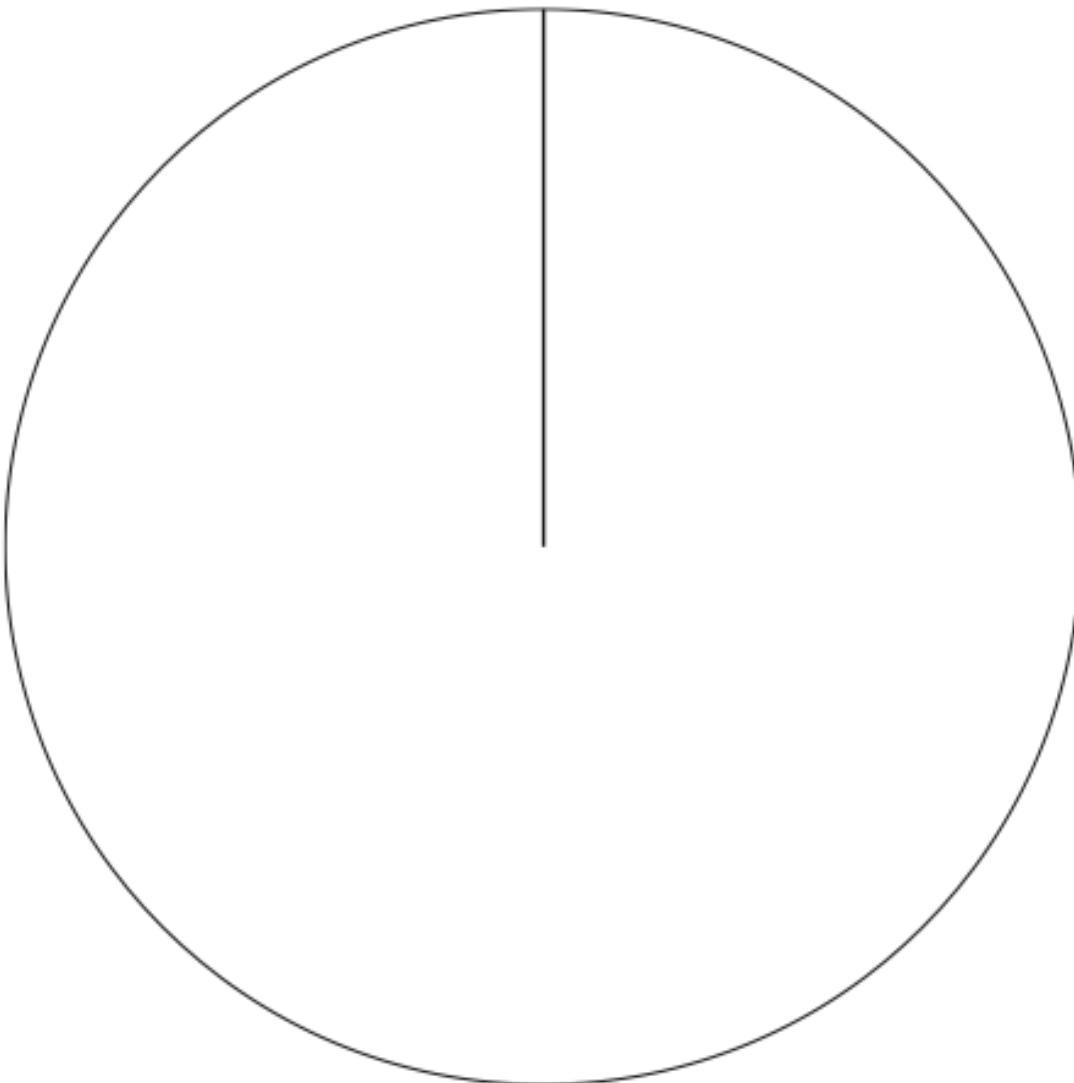


(2)

26. The table gives information about the grades student got in a test.

Grade	Frequency
A	10
B	15
C	13
D	5
E	2

Draw an accurate pie chart to show this information.



(4)

27. Timothy asked 30 people how long it takes them to get to school.

The table shows some information about his results.

Time (t minutes)	Frequency
$0 < t \leq 10$	2
$10 < t \leq 20$	8
$20 < t \leq 30$	12
$30 < t \leq 40$	7
$40 < t \leq 50$	1

Work out an estimate for the mean time taken.

.....minutes  
**(4)**

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28. The 10 students from class A and the 15 students from class B sit a test.

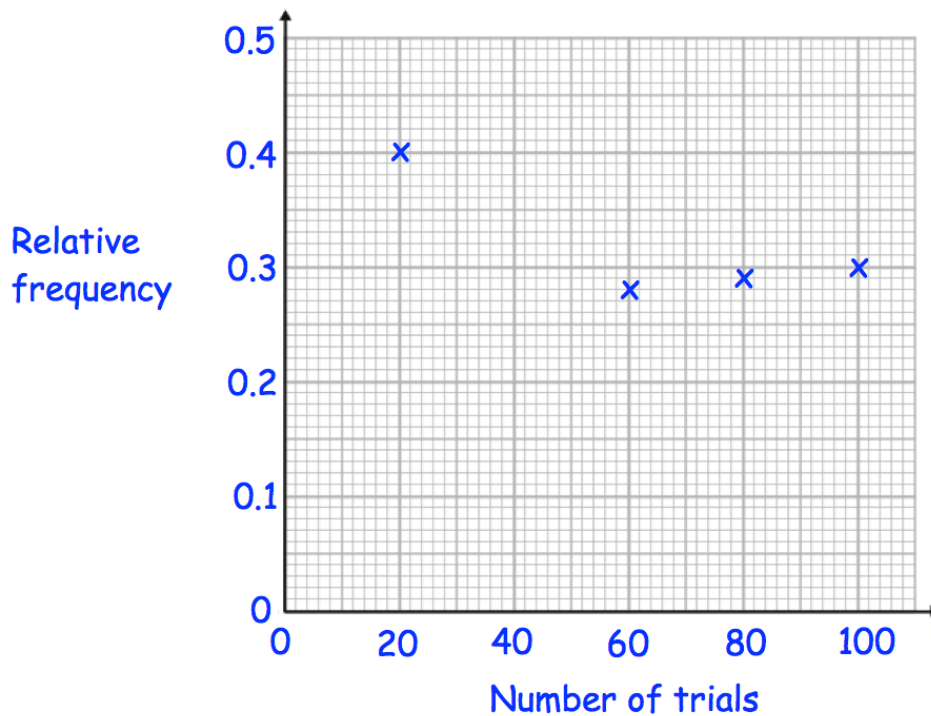
The mean mark for the class B is 70.

The mean mark for all 25 students is 77.

Work out the mean mark for the class A.

.....  
**(3)**

29. There are 50 sweets in a jar.  
 In a trial, a sweet is chosen at random and then it is replaced.  
 The results are recorded after every 20 trials.  
 The graph shows the relative frequency of a blue sweet



In the first forty trials, ten blue sweets were chosen.

- (a) Plot this result on the graph.

(1)

- (b) What is the best estimate, from the graph, of the probability of choosing a blue sweet?  
 Explain your answer.

.....

.....

.....

(2)

- (c) Use your answer to estimate the number of blue sweets in the jar.

.....

(2)



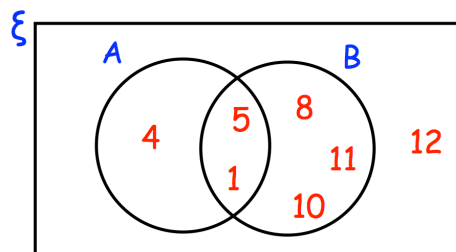
30. 480 students attend a school  
A teacher asks 50 students which colour they would like the new school blazer.

Colour	Number of students
Black	20
Navy	15
Green	9
Maroon	6

Estimate how many of the 480 students would like a navy blazer.

.....  
(2)

31. Here is a Venn diagram.



A number is chosen at random.

- (a) Write down  $P(A \cap B)$

.....  
(2)

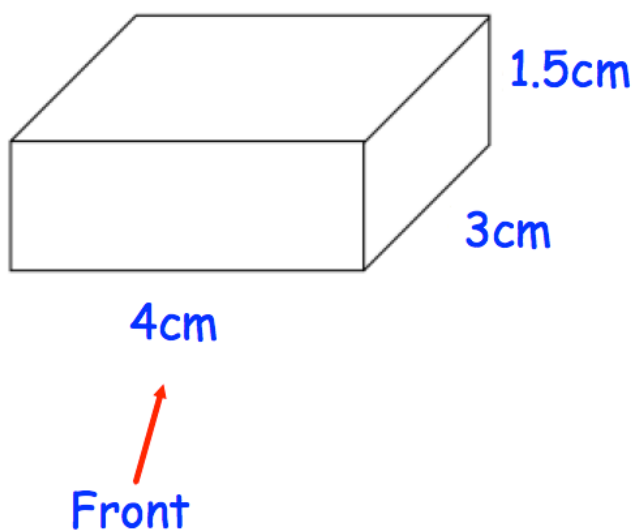
- (b) Write down  $P(A \cup B)$

.....  
(2)

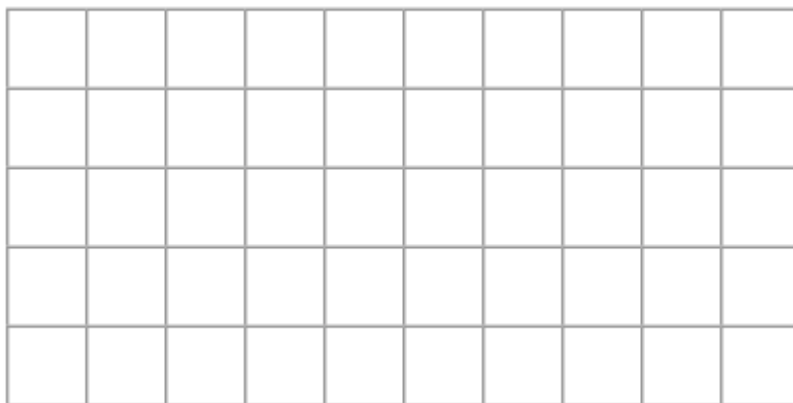
- (c) Write down  $P(A \cup B')$

.....  
(2)

32. Shown below is a cuboid.

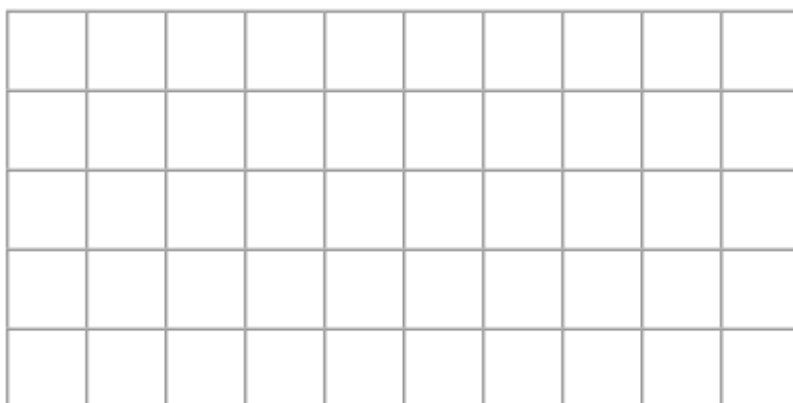


(a) On the centimetre square grid, draw the front elevation.



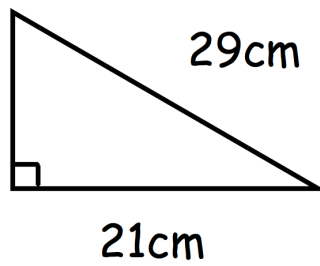
**(2)**

(b) On the centimetre square grid, draw the plan view.



**(2)**

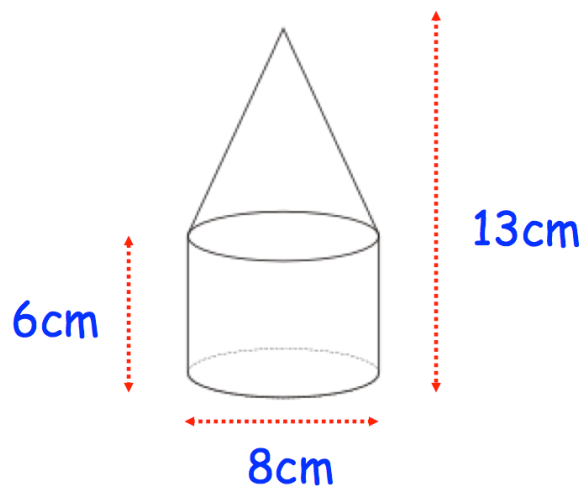
33. Shown is a right angled triangle.



Find the area of the triangle.

.....  
(4)

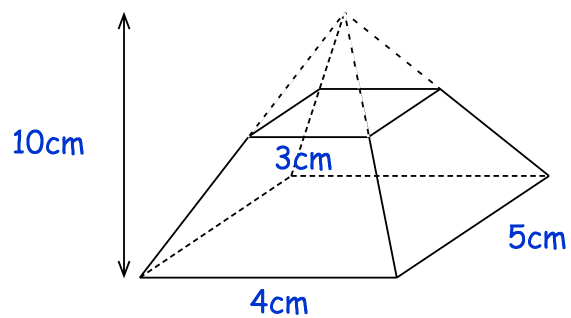
34. A solid is formed from a cylinder and a cone.  
Find the volume of the solid.



.....cm<sup>3</sup>  
(3)

35. A solid pyramid, of height 10cm, is divided into two parts by removing a smaller pyramid from the top.

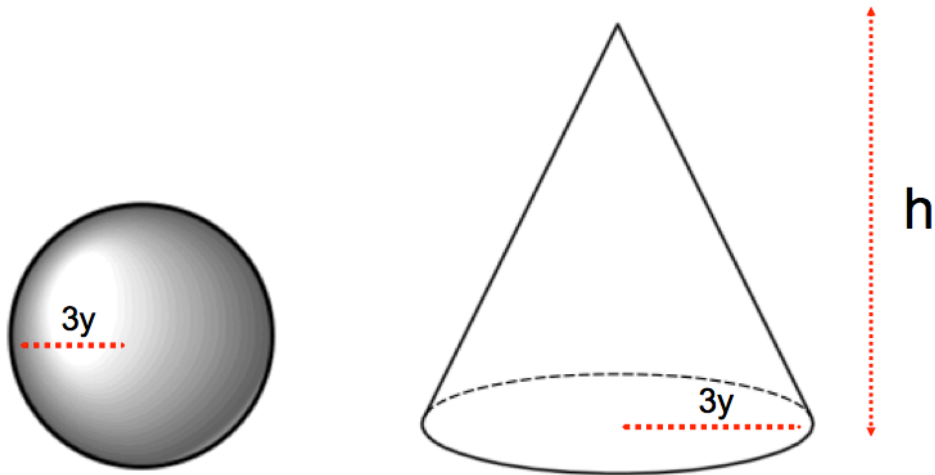
The remaining frustum is shown below.



Work out the volume of the frustum

.....  
(5)

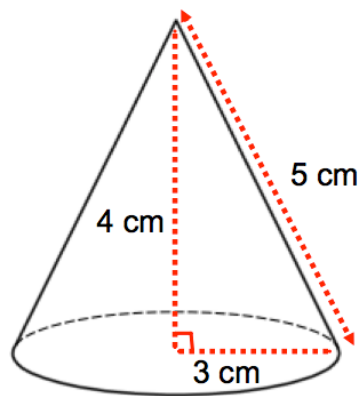
36. This sphere and cone have the same volume.



Find an expression for  $h$  in terms of  $y$ .

$h = \dots\dots\dots$   
(5)

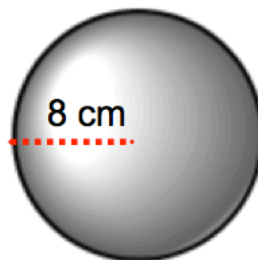
37. A cone has base radius 3cm, perpendicular height 4cm and slant height 5cm.



Work out the surface area of the cone.

.....cm<sup>2</sup>  
**(3)**

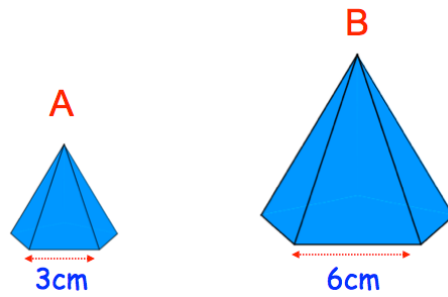
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38. Shown is a sphere with radius 8cm.



Calculate the surface area of the sphere.  
Give your answer to 1 decimal place.

.....cm<sup>2</sup>  
**(3)**

39. Below are two similar pyramids.



Pyramid A has a volume of  $26\text{cm}^3$

(a) Work out the volume of Pyramid B.

..... $\text{cm}^3$   
(2)

Pyramid B has a total surface area of  $224\text{cm}^2$

(b) Work out the total surface area of Pyramid A.

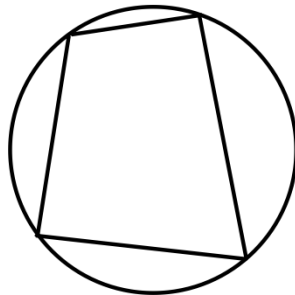
..... $\text{cm}^2$   
(2)

40. Find the pressure exerted by a force of 240 newtons on an area of  $30\text{cm}^2$   
Give your answer in  $\text{newtons/m}^2$

.....  
**(3)**

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41.



Prove the opposite angles in a cyclic quadrilateral add to  $180^\circ$

**(3)**



42. Convert 4m/s into km/h

.....  
**(2)**





