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0178/01
May/June 2024
1 hour
Marks: 60

Candidates answer on the Question Paper.

Do not use staples, paper clips, glue or correction fluid.

The number of marks is given in brackets [] at the end of each question or part question.



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1 Evaluate

(a) 20% of M450,

M.....[1]

(b) $0.5 \div \frac{2}{3}$,

.....[1]

(c) $64^{\frac{1}{3}}$.

.....[2]

 2 Express 36 seconds as a fraction of an hour in its simplest form.

.....[2]

3 $A = 3.2 \times 10^3$ and $B = 2.4 \times 10^2$.

Work out, leaving the answer in standard form.

(a) $2B$,

.....[1]

(b) $A - B$.

.....[2]

4 Estimate the value of

$$\frac{36.88 \times 2.87}{1.56^2}$$

.....[2]

5 Expand and simplify

$$-2(x - 3).$$

.....[1]

6 Solve the equations

(a) $27 = 3x - 6$,

$x = \dots\dots\dots$ [2]

(b) $x^2 + 7x + 12 = 0$.

$x = \dots\dots\dots$ Or $x = \dots\dots\dots$ [2]

7 Factorise fully

(a) $2b^2 - 2$,

$\dots\dots\dots$ [2]

(b) $ac + ad - bc - bd$.

$\dots\dots\dots$ [2]

- 8 A flight from place **A** started at 2047.
It took 7 hours 36 minutes to arrive at place **B**, whose time zone is 2 hours behind that of place **A**.

Find the time at place **B** on arrival.

.....[2]

- 9 The ratio of exterior angle to interior angle of a polygon is 2 : 7.

Find the number of sides of the polygon.

.....[2]

10 $V = \frac{1}{3}\pi r^2 h$

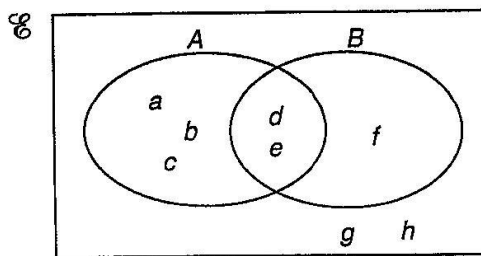
- (a) Find, in terms of π , the value of V when $r = 6$ and $h = 5$.

$V = \dots\dots\dots$ [2]

- (b) Make h the subject of the formula.

$h = \dots\dots\dots$ [2]

11 Venn diagram shows elements of the universal set, set A and set B .



(a) Use set notation to complete the statement:

$\{a, b, c\}$ A [1]

(b) Find

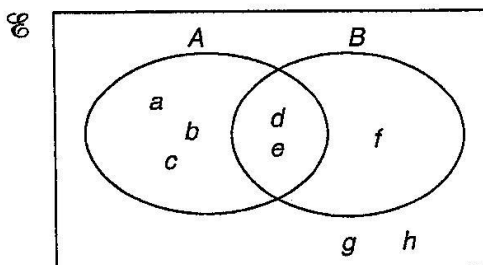
(i) $A \cap B$,

.....[1]

(ii) $n(A \cup B)'$.

.....[1]

(c) Shade $A' \cap B$.



[1]

12 Given $\mathbf{A} = \begin{pmatrix} 6 & 0 \\ 1 & 2 \end{pmatrix}$ and $\mathbf{B} = \begin{pmatrix} 2 & 3 \\ 1 & 1 \end{pmatrix}$,

evaluate

(a) $2\mathbf{B}$,

$\left(\quad \right) [1]$

(b) $\mathbf{A} - \mathbf{B}$.

$\left(\quad \right) [2]$

13 $P(-3, -3)$ and $Q(2, 12)$ are the points on a straight line.

Find

(a) the gradient of PQ ,

..... [2]

(b) the coordinates of the midpoint of PQ .

..... [2]

14 $\overrightarrow{PQ} = \begin{pmatrix} 5 \\ 12 \end{pmatrix}$ and $P(1,2)$.

Find

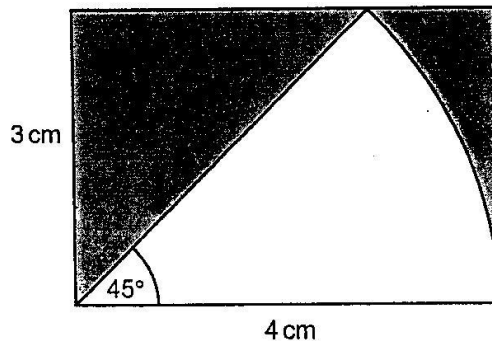
(a) the coordinates of Q ,

$Q(\dots\dots\dots, \dots\dots\dots)$ [2]

(b) the magnitude of PQ .

$\dots\dots\dots$ units [2]

15 The diagram shows a rectangle with an inscribed sector of 45° .



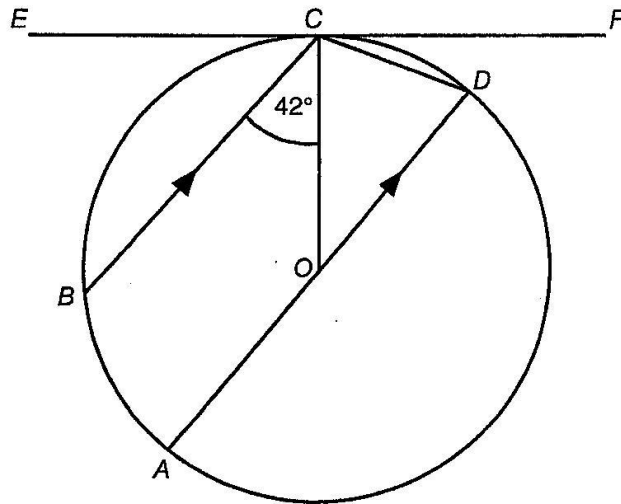
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Calculate, in terms of π , the area of the **shaded** parts.

Give your answer in the form $a - b\pi$, where a and b are integers.

$\dots\dots\dots$ cm² [3]

- 16 The diagram shows a circle centre O and AD as the diameter.
 BC is parallel to AD and EF is a tangent to the circle at C .
 Angle $OCB = 42^\circ$.



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Find the size of

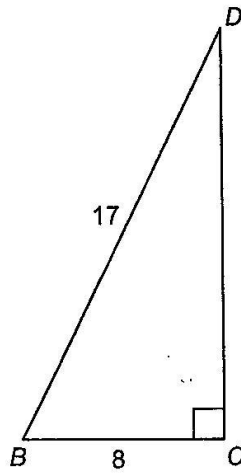
(a) the angle ECB ,

(b) the angle ODC .

.....^o [1]

.....^o [2]

- 17 The diagram shows a right-angled triangle BCD .
 $BC = 8$ units and $BD = 17$ units.



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Find

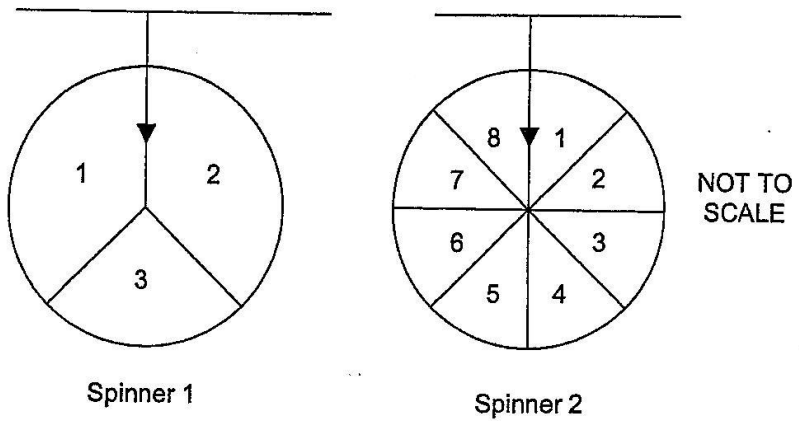
- (a) the length of CD ,

..... units [2]

- (b) the exact value of $\cos CBD$.

..... [1]

- 18 The diagram shows the regions of two fair spinners with pointers at the rest positions.



- (a) Spinner 2 is spun once.

Find the probability that the pointer lands at the region 2.

..... [1]

- (b) The two spinners are spun simultaneously.

Find the probability that both pointers land at an even number.

..... [2]

19 The table shows the results of 60 children asked about the number of toys they have.

Number of toys	0	1	2	3	4	5
Frequency	12	8	5	9	17	9

(a) Find

(i) the mode of the distribution,

..... [1]

(ii) the median of the distribution.

..... [2]

(b) Two more children are asked about the number of toys they have.

Explain clearly, between the mode, mean and median, what would change.

.....

 [2]