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0607/23

October/November 2016

**45 minutes**

**Additional Materials:** Geometrical Instruments

## READ THESE INSTRUCTIONS FIRST

DO **NOT** WRITE IN ANY BARCODES.

The total number of marks for this paper is 40.

This document consists of **8** printed pages.

## Formula List

For the equation  $ax^2 + bx + c = 0$   $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Curved surface area,  $A$ , of cylinder of radius  $r$ , height  $h$ .  $A = 2\pi rh$

Curved surface area,  $A$ , of cone of radius  $r$ , sloping edge  $l$ .  $A = \pi rl$

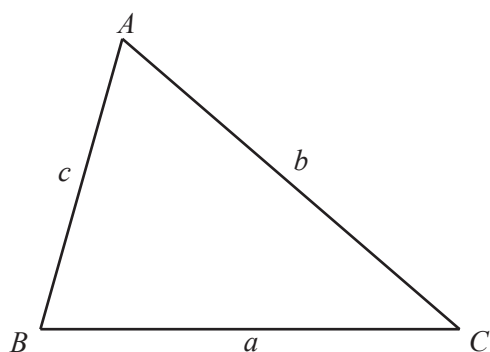
Curved surface area,  $A$ , of sphere of radius  $r$ .  $A = 4\pi r^2$

Volume,  $V$ , of pyramid, base area  $A$ , height  $h$ .  $V = \frac{1}{3}Ah$

Volume,  $V$ , of cylinder of radius  $r$ , height  $h$ .  $V = \pi r^2 h$

Volume,  $V$ , of cone of radius  $r$ , height  $h$ .  $V = \frac{1}{3}\pi r^2 h$

Volume,  $V$ , of sphere of radius  $r$ .  $V = \frac{4}{3}\pi r^3$



$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$\text{Area} = \frac{1}{2}bc \sin A$$

Answer **all** the questions.

- 1 Here are the first four terms of a sequence.

11      8      5      2

Write down the next term of the sequence.

..... [1]

- 2 Use the formula  $A = \frac{h}{2}(x + y)$  to find the value of  $A$  when  $x = 7$ ,  $y = 13$  and  $h = 6.4$ .

$A =$  ..... [2]

- 3 Work out.

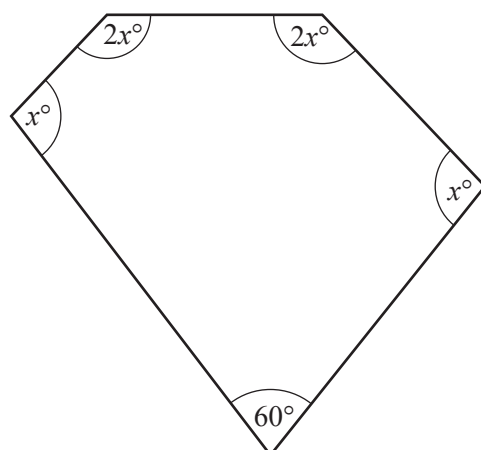
(a)  $(0.2)^3$

..... [1]

(b)  $\frac{3}{7} \div \frac{4}{5}$

..... [2]

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NOT TO  
SCALE

The diagram shows a pentagon.

Find the value of  $x$ .

$x =$  ..... [3]

- 5** Triangle B is the image of triangle A after a reflection.  
 Triangle C is the image of triangle B after an enlargement, scale factor 2.  
 Triangle D is the image of triangle C after a rotation.  
 Triangle E is the image of triangle D after a stretch, factor 3.

Complete this table.

Write C if the triangles are congruent.

Write S if the triangles are similar.

Write N if the triangles are neither congruent nor similar.

Triangles	C, S or N
A and B	
A and C	
B and D	
D and E	

[3]

- 6** The table shows the numbers of pets owned by each of 100 families.

Number of pets	Frequency
0	23
1	37
2	25
3	10
4	5

- (a)** Write down the range.

..... [1]

- (b)** Find the median.

..... [1]

- (c)** Work out the mean.

..... [2]

- 7 Solve the simultaneous equations.

$$\begin{aligned}4x - 3y &= 12 \\ 6x - y &= 11\end{aligned}$$

$$x = \dots\dots\dots$$

$$y = \dots\dots\dots [3]$$

- 8 Jakob draws a scatter diagram which shows that two quantities,  $x$  and  $y$ , are correlated. He calculates the equation of the regression line as  $y = 32 - 1.5x$ .

- (a) What type of correlation is there between  $x$  and  $y$ ?

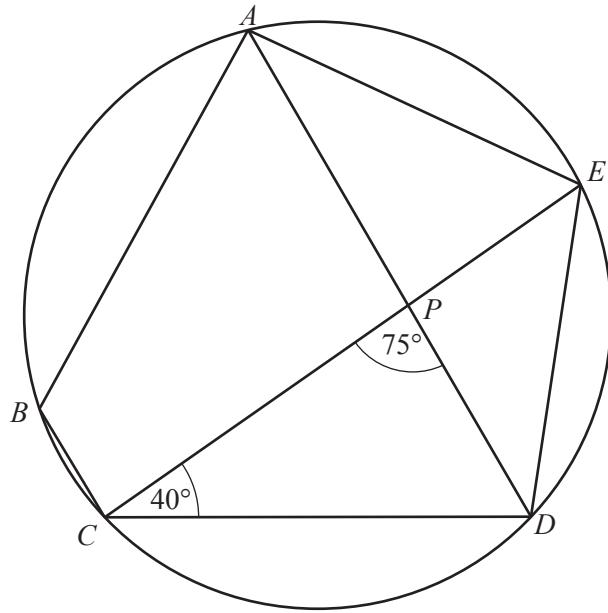
..... [1]

- (b) The mean of the  $y$  values is 14.

Find the mean of the  $x$  values.

..... [2]

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$A, B, C, D$  and  $E$  are points on a circle.  
 $CE$  and  $AD$  intersect at  $P$ .  
 Angle  $DCP = 40^\circ$  and angle  $CPD = 75^\circ$ .

Find

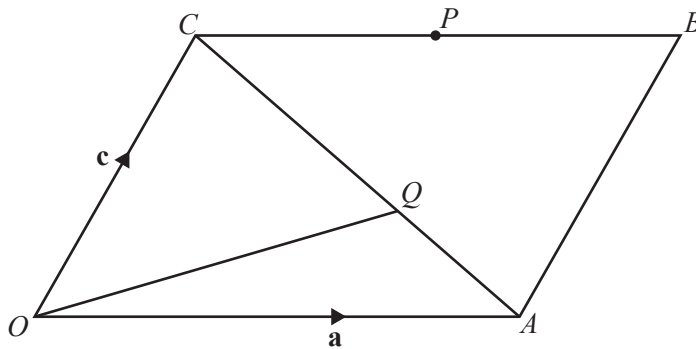
(a) angle  $DAE$ ,Angle  $DAE = \dots\dots\dots$  [1](b) angle  $ABC$ .Angle  $ABC = \dots\dots\dots$  [2]10 (a) Find  $\log_5 25$ . $\dots\dots\dots$  [1](b)  $2 \log 3 - \log 5 = \log p$ Find  $p$ . $p = \dots\dots\dots$  [2]

11 Solve.

$$4x + 2 > 3(2x - 4)$$

..... [3]

12



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$OACB$  is a parallelogram.

$P$  is the midpoint of  $CB$ .

$CQ : QA = 5 : 3$ .

$\vec{OA} = \mathbf{a}$  and  $\vec{OC} = \mathbf{c}$ .

Find these vectors in terms of  $\mathbf{a}$  and/or  $\mathbf{c}$ , giving your answers in their simplest form.

(a)  $\vec{CP}$

..... [1]

(b)  $\vec{OQ}$

..... [3]

Question 13 is printed on the next page.

**13** Simplify.

**(a)**  $\frac{12}{\sqrt{2}}$

..... [2]

**(b)**  $(5 - 2\sqrt{3})^2$

..... [3]

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