

1 Make  $t$  the subject of the formula  $2(d - t) = 4t + 7$

$$t = \dots\dots\dots$$

(Total for Question 1 is 3 marks)

2 (a) Expand  $3(2y - 5)$

.....  
(1)

(b) Factorise completely  $8x^2 + 4xy$

.....  
(2)

(c) Make  $h$  the subject of the formula

$$t = \frac{gh}{10}$$

$$h = \dots\dots\dots$$

(2)

(Total for Question 2 is 5 marks)

3 You can change temperatures from °F to °C by using the formula

$$C = \frac{5(F - 32)}{9}$$

$F$  is the temperature in °F.

$C$  is the temperature in °C.

The minimum temperature in an elderly person's home should be 20°C.

Mrs Smith is an elderly person.

The temperature in Mrs Smith's home is 77°F.

\*(a) Decide whether or not the temperature in Mrs Smith's home is lower than the minimum temperature should be.

(3)

(b) Make  $F$  the subject of the formula  $C = \frac{5(F - 32)}{9}$

.....  
(3)

(Total for Question 3 is 6 marks)

4 Make  $a$  the subject of the formula  $p = \frac{a^3 + 5}{4 - a^3}$

.....  
(Total for Question 4 is 4 marks)

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5. Here is a shape  $ABCDE$ .

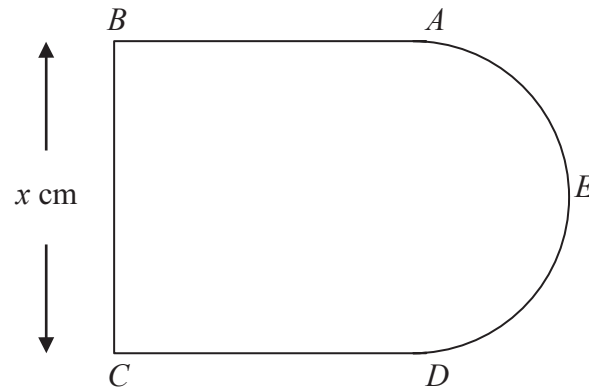


Diagram **NOT**  
accurately drawn

$AB$ ,  $BC$  and  $CD$  are three sides of a square.

$BC = x$  cm.

$AED$  is a semicircle with diameter  $AD$ .

The perimeter,  $P$  cm, of the shape  $ABCDE$  is given by the formula

$$P = 3x + \frac{\pi x}{2}$$

(a) Rearrange this formula to make  $x$  the subject.

.....  
(2)

The area,  $A \text{ cm}^2$ , of this shape is given by  $A = kx^2$  where  $k$  is a constant.

- (b) Find the exact value of  $k$ .  
Give your answer in its simplest form.

.....  
(3)

(Total 5 marks)

- 6 . Make  $q$  the subject of the formula  $5(q + p) = 4 + 8p$   
Give your answer in its simplest form.

$q =$  .....

(Total 3 marks)

7 Make  $t$  the subject of the formula

$$p = \frac{3 - 2t}{4 + t}$$

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**(Total for Question 7 is 4 marks)**

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**8** Make  $y$  the subject of the formula

$$t = \frac{2 - 3y}{y + 2}$$

.....  
(4)

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**(Total for Question 8 is 7 marks)**

**9** (a) Simplify  $2a^3b \times 5a^2b^3$

.....  
(2)

(b) Make  $y$  the subject of the formula  $p = \sqrt{\frac{x+y}{5}}$

.....  
(3)

**(Total for Question 9 is 5 marks)**

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**10** Make  $v$  the subject of the formula  $t = \frac{v}{5} + 2$

$v =$  .....

**(Total 2 marks)**

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**11** Make  $p$  the subject of the formula  $y = 3p^2 - 4$

.....  
**(Total for Question 11 is 3 marks)**

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**12**  $A = 4bc$

$$A = 100$$

$$b = 2$$

(a) Work out the value of  $c$ .

.....  
(2)

$$m = \sqrt{\frac{k+1}{4}}$$

(b) Make  $k$  the subject of the formula.

.....  
(3)

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(Total for Question 12 is 5 marks)

**13** (a) Factorise  $4x^2 - 9$

.....  
(1)

(b) Make  $m$  the subject of

$$g - 3m = am + 5$$

.....  
(3)

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**(Total for Question 13 is 4 marks)**

**14** (a) Simplify fully  $\frac{2x^2 - 5x + 3}{x^2 + 5x - 6}$

.....  
(3)

(b) Make  $m$  the subject of

$$\frac{m}{v} - \frac{t}{b} = \frac{m - t}{R}$$

.....  
(4)

(Total for Question 14 is 7 marks)

**15** (a) Solve  $3x^2 = 147$

.....  
(2)

(b) Work out the value of  $2^{-3}$

.....  
(1)

(c) Simplify  $(3x^2)^3$

.....  
(2)

$$w = 4p - 16$$

(d) Make  $p$  the subject of this formula.

.....  
(2)

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**(Total for Question 15 is 7 marks)**

**16** Make  $k$  the subject of the formula  $t = \frac{k}{k-2}$

.....

**(Total 4 marks)**

17.  $y = p - 2qx^2$

$$p = -10$$

$$q = 3$$

$$x = -5$$

(a) Work out the value of  $y$ .

.....  
(2)

(b) Rearrange  $y = p - 2qx^2$

to make  $x$  the subject of the formula.

.....  
(3)

(Total 5 marks)

**18** Make  $A$  the subject of the formula

$$r = \sqrt{\frac{A}{3}}$$

$$A = \dots\dots\dots$$

**(Total 2 marks)**