$y = -2x + 5$ and $x = 1$

$y = -2 (1) + 5$

$y = -2 + 5$

$y = 3$

SUBSTITUTION

$(\times y) - (2 \times y)$

$3) - (2 \times 3)$

$= 9 - 6$

$= 3$

$x = 4$

$3x + 7 = (3 \times x) + 7$

$= (3 \times 4) + 7$

$= 12 + 7$

$= 19$

1. $P = 3n$
     $n = 6$

   (a)   Work out the value of P.

   $P = 3 \times 6 = 18$

                                                   $P =$ ....18........
                                                                            (1)

         $Q = 2c + d$
         $c = 3$
         $d = 2$

   (b)   Work out the value of Q.

   $Q = 2(3) + 2 = 8$
                                                   $Q =$ ....8........
                                                                            (2)
                                                            (Total 3 marks)

2. $p = 5$
     $r = 2$

   (a)   Work out the value of

               $4p + 3r$

   $4(5) + 3(2)$
   $= 26$ ....26........
                                                                            (2)

         n is an even number.

   (b)   What type of number is $n + 1$?

                                                   ....odd........
                                                                            (1)
                                                            (Total 3 marks)

The Maths Society

3. $y = 5x - 3$

Find the value of y when $x = 9$

$$y = 5(9) - 3$$
$$= 42$$

$y = \underline{ 42 }$

(2)
(Total 2 marks)

4. $P = 4k - 10$

$k = 7$

(a) Work out the value of k. ① P

$$P = 4(7) - 10$$
$$= 18$$

$\underline{ 18 }$

(2)

$y = 4n - 3d$

$n = 2$
$d = 5$

(b) Work out the value of y.

$$y = 4(2) - 3(5)$$
$$= 8 - 15 = -7$$

$\underline{ -7 }$

(2)
(Total 4 marks)

5. $v = u + 10t$

Work out the value of v when

$u = 10$ and $t = 7$

$$v = 10 + 10(7) = 80$$

$v = \underline{ 80 }$

(Total 2 marks)

The Maths Society

6.

Take **two** 5 m*l* spoons full
twice a day

300 m*l*

You can work out the amount of medicine, *c* m*l*, to give to a child by using the formula

$$c = \frac{ma}{150}$$

m is the age of the child, in months.
a is an adult dose, in m*l*.

A child is 30 months old.
An adult's dose is 40 m*l*.

Work out the amount of medicine you can give to the child.

$$C = \frac{30 \times 40}{150} = 8$$

................................8........................ m*l*

(Total 2 marks)

7. $V = 3b + 2b^2$

Find the value of *V* when *b* = 4

$$V = 3(4) + 2(4)^2$$
$$= 12 + 32$$
$$= 44$$

....................44....................

(Total 2 marks)

The Maths Society

8. (a) Work out the value of $3p + 4q$ when $p = 5$ and $q = -2$

$3(5) + 4(-2)$
$= 15 - 8$

............7............

(2)

(b) Given that $y = 4x - 3$, work out the value of x when $y = 11$

$11 = 4x - 3$
$14 = 4x$
$x = 14/4 = 3.5$

$x =$ ....3.5............

(3)

(Total 5 marks)

9. Work out the value of $5x + 1$ when $x = -3$

$5(-3) + 1 = -14$

............−14............

(2)

(Total 2 marks)

10. (a) Work out the value of $3x - 4y$ when $x = 3$ and $y = 2$

$3(3) - 4(2)$
$= 9 - 8$

............1............

(2)

(b) Work out the value of $\frac{p(q-3)}{4}$ when $p = 2$ and $q = -7$

$\frac{2(-7-3)}{4} = -\frac{20}{4} = -5$

............−5............

(3)

(Total 5 marks)

The Maths Society

11. $S = 2p + 3q$

$p = -4$
$q = 5$

(a) Work out the value of S.

$$S = 2(-4) + 3(5)$$
$$= -8 + 15 = 7$$

$S = \underline{\hspace{0.5cm} 7 \hspace{2cm}}$

(2)

$T = 2m + 30$

$T = 40$

(b) Work out the value of m.

$$40 = 2m + 30$$
$$10 = 2m$$
$$m = 5$$

$m = \underline{\hspace{0.5cm} 5 \hspace{2cm}}$

(2)

(Total 4 marks)

12. $A = 4bc$

$A = 100$
$b = 2$

Work out the value of c.

$$100 = 4 \times 2c$$

$$c = \frac{100}{8} = 12.5$$

$c = \underline{\hspace{0.5cm} 12.5 \hspace{1.5cm}}$

(2)

(Total 2 marks)

The Maths Society

13. (a) Work out the value of $2a + ay$ when $a = 5$ and $y = -3$

$2(5) + 5(-3)$

$= 10 - 15$

.... -5 ....

(2)

(b) Work out the value of $5t^2 - 7$ when $t = 4$

$5(4)^2 - 7$

$= 80 - 7$

$= 73$

.... 73 ....

(3)

(Total 5 marks)

14. $A = \dfrac{h(x+10)}{2}$

$A = 27$

$h = 4$

Work out the value of x

$27 = \dfrac{4(x+10)}{2}$

$x + 10 = \dfrac{27}{2}$

$x = 13.5 - 10$

$= 3.5$

$x =$ .... 3.5 ....

(Total 3 marks)

The Maths Society

15. $h = 5t^2 + 2$

(i) Work out the value of h when $t = -2$

$$h = 5(-2)^2 + 2$$
$$= 20 + 2$$
$$= 22$$

.... 22 ....

(3)

(ii) Work out a value of t when $h = 47$

$$47 = 5t^2 + 2$$
$$5t^2 = 45$$
$$t^2 = 9$$
$$t = \pm 3$$

.... ± 3 ....

(3)

(Total 5 marks)

16. $V = 3b + 2b^2$

Find the value of V when $b = -4$

(3)

$$V = 3(-4) + 2(-4)^2$$
$$= -12 + 32$$
$$= 20$$

.... 20 ....

(Total 3 marks)

The Maths Society

1 $f = 7$
       $g = 5$

Work out the value of $3f + 2g$

$$3(7) + 2(5)$$
$$= 21 + 10$$
$$= 21$$

                          21

(Total for Question 1 is 2 marks)

2 $c = 4d - 7$

Find the value of c when $d = 6$

$$c = 4(6) - 7$$
$$= 24 - 7$$
$$= 17$$

                          17

(Total for Question 2 is 2 marks)

3 $v = u + at$

       $u = 3$
       $a = 10$
       $t = 6$

Work out the value of v.

$$v = 3 + 10(6)$$
$$= 63$$

          $v =$ 63

(Total for Question 3 is 2 marks)

4 $x = 4$
       $y = 6$

Work out the value of $3x - y$

$$3(4) - 6$$
$$= 12 - 6$$
$$= 6$$

                          6

(Total for Question 4 is 2 marks)

The Maths Society

5 $L = 9m + 2n$

Work out the value of L when $m = 3$ and $n = -6$

$$L = 9(3) + 2(-6)$$
$$= 27 - 12$$
$$= 15$$

15

(Total for Question 5 is 2 marks)

6 $q = 5p + 3r$

$p = 6$
$r = -4$

Work out the value of q.

$$q = 5(6) + 3(-4)$$
$$= 30 - 12$$
$$= 18$$

18

(Total for Question 6 is 2 marks)

7 $H = 4f + g$

Work out the value of H when $f = 5$ and $g = -2$

$$H = 4(5) - 2 = 20 - 2 = 18$$

18

(Total for Question 7 is 2 marks)

8 $A = 4p + 5q$

$p = 3$
$q = -2$

Work out the value of A.

$$A = 4(3) + 5(-2)$$
$$= 12 - 10$$
$$= 2$$

2

(Total for Question 8 is 2 marks)

The Maths Society

9 $L = 9m + 2n$

Work out the value of L when $m = -3$ and $n = 4$

$$L = 9(-3) + 2(4)$$
$$= -27 + 8$$
$$= -9$$

-19

(Total for Question 9 is 2 marks)

10 $q = 6p - r$

$p = -4$
$r = 5$

Work out the value of q.

$$q = 6(-4) - 5$$
$$= -24 - 5$$
$$= -29$$

-29

(Total for Question 10 is 2 marks)

11 $H = f - 2g$

Work out the value of H when $f = 12$ and $g = -6$

$$H = 12 - 2(-6)$$
$$= 24$$

24

(Total for Question 11 is 2 marks)

12 $A = 5p + 6q$

$p = 10$
$q = -2$

Work out the value of A.

$$A = 5(10) + 6(-2)$$
$$= 50 - 12$$
$$= 38$$

38

(Total for Question 12 is 2 marks)

13 $L = m(n - 2)$

Work out the value of L when $m = 9$ and $n = 5$

$$L = 9(5-2) = 27$$

27

(Total for Question 13 is 2 marks)

14 $a = 5bc$

$b = -4$
$c = -3$

Work out the value of a.

$$a = 5(-4)(-3) = 60$$

60

(Total for Question 14 is 2 marks)

15 $x = 4y^2 - 12$

Work out the value of x when $y = 5$

$$x = 4(5)^2 - 12$$
$$= 100 - 12$$
$$= 88$$

88

(Total for Question 15 is 2 marks)

16 $A = p - 2q$

$p = -4$
$q = -7$

Work out the value of A.

$$A = -4 - 2(-7)$$
$$= -4 + 14 = 10$$

10

(Total for Question 16 is 2 marks)

The Maths Society

17 $a = 8$
$b = -5$
$c = 2$

Work out the value of $b^2 - 4ac$

$$(-5)^2 - 4(8)(2)$$
$$= 25 - 64$$
$$= -39$$

_____ -39 _____
(Total for Question 17 is 2 marks)

18 $d = \dfrac{m}{v}$

Work out the value of d when $m = 32$ and $v = 8$

$$d = \frac{32}{8} = 4$$

_____ 4 _____
(Total for Question 18 is 2 marks)

19 $A = 2j - jk$

Work out the value of A when $j = 7$ and $k = 3$

$$A = 2(7) - 7(3)$$
$$= 14 - 21$$
$$= -7$$

_____ -7 _____
(Total for Question 19 is 2 marks)

20 $w = 5x^2 + 3$

$x = -3$

Work out the value of w.

$$w = 5(-3)^2 + 3$$
$$= 45 + 3$$
$$= 48$$

_____ 48 _____
(Total for Question 20 is 2 marks)

The Maths Society

21 $A = \frac{1}{2}bh$

Work out the value of A when $b = 3$ and $h = 8$

$$A = \frac{1}{2}(3)(8) = 12$$

12

22 $A = \frac{1}{2}(a+b)h$

Work out the value of A when $a = 7$, $b = 6$ and $h = 10$

$$A = \frac{1}{2}(7+6)(10)$$
$$= 65$$

65

23 $v = u + at$

Work out the value of v when $u = 12$, $a = -6$ and $t = 5$

$$v = 12 + (-6)(5)$$
$$= 12 - 30$$
$$= -18$$

−18

24 $y = mx + c$

$m = -2$
$x = 12$
$c = -7$

Work out the value of y.

$$y = -2(12) - 7$$
$$= -24 - 7 = -31$$

−31

The Maths Society

25 $s = ut + \frac{1}{2}at^2$

$u = 3$
$a = 2$
$t = 4$

Work out the value of s.

$$S = 3(4) + \frac{1}{2}(2)(4)^2$$
$$= 12 + 16$$
$$= 28$$

$s =$ _____ 28

(Total for Question 25 is 2 marks)

26 $s = ut + \frac{1}{2}at^2$

$u = -5$
$a = 4$
$t = 3$

Work out the value of s.

$$S = -5(3) + \frac{1}{2}(4)(3)^2$$
$$= -15 + 18$$
$$= 3$$

$s =$ _____ 3

(Total for Question 26 is 2 marks)

27 $s = \frac{v^2 - u^2}{2a}$

$v = 7$
$u = 5$
$a = 3$

Work out the value of s.

$$S = \frac{7^2 - 5^2}{2(3)}$$
$$= \frac{49 - 25}{6} = \frac{24}{6} = 4$$

$s =$ _____ 4

(Total for Question 27 is 2 marks)

The Maths Society

1. Find the value of $5c + 2$ if $c = 6$

$$5(6) + 2 = 32$$

32

(1)

2. Find the value of $4a - b$ when $a = 9$ and $b = 8$

$$4(9) - 8$$
$$= 36 - 8$$
$$= 28$$

28

(2)

3. Find the value of $12h + 9t$ when $h = 11$ and $t = 3$

$$12(11) + 9(3)$$
$$= 132 + 27$$
$$= 159$$

159

(2)

4. Circle the expression that has the greatest value when $y = 10$

$2y$ $31 - y$ $y + 9$ $\dfrac{y}{2}$

20   21   19   5

The Maths Society

(1)

5. If $x = 6$ and $y = -2$, find the value of

(a) x^2

36

(1)

(b) $5x + y$

$5(6) - 2$

$= 28$

28

(1)

(c) $x + y^2$

$6 + 4 = 10$

10

(1)

(d) $\dfrac{y + 20}{x}$

$\dfrac{-2 + 20}{6} = 3$

3

(2)

6. $P = 2W + 2L$

Find P if W = 3 and L = 9

$P = 2(3) + 2(9)$

$= 6 + 18$

$= 24$

24

(2)

The Maths Society

7. You are given that $m = 0.5, \ p = 0.75$ and $c = 2.2$

Find the value of

(a) $3c + m$

$3(2.2) + 0.5$

$= 6.6 + 0.5$

$= 7.1$

..........7.1..........
(2)

(b) $m + p + c$

$0.5 + 0.75 + 2.2$

$= 1.25 + 2.2$

$= 3.45$

..........3.45..........
(1)

8. The cost of hiring a hot tub is found using the formula

Hire cost = £50 plus an extra £45 per day

(a) Work out the hire cost for hiring the hot tub for 21 days.

$50 + 45 \times 21$

£995 ....
(2)

Alex hires the hot tub for a number of days and the cost is £545

(b) How many days did Alex hire the hot tub?

Hire $= 50 + 45 \times d$

$545 = 50 + 45d$

$d = 11 \ days$

....
(2)

The Maths Society

9. This formula can be used to convert between Celsuis (C) and Fahrenheit (F).

$$F = 1.8C + 32$$

(a) Convert $2°C$ into Fahrenheit

$$F = 35.6$$

....
(2)

(b) Convert $50°F$ into Celsius

$$\frac{50-32}{1.8} = C$$

$$C = 10$$

....
(2)

10. Given that $a = 4,\ b = 9$ and $c = -5$

Work out the value of

$$\frac{ab + 24}{2c}$$

$$\frac{4 \times 9 + 24}{-10} = -6$$

....
(3)

The Maths Society

11. (a) Find the value of $5(a + c)$ when $a = 4$ and $c = 9$

$$5(4+9)$$
$$65$$

....
(2)

(b) Find the value of $7x + 2y$ when $x = 2$ and $y = -9$

$$14 - 18$$
$$-4$$

....
(2)

12. $P = 2W + 2L$

Find W if P = 30 and L = 11

$$30 = 2W + 22$$
$$2W = 8$$
$$W = 4$$

....
(2)

13. $y = w - 2a^2$

$w = 400$
$a = 5$

Work out the value of y

$$y = 400 - 50$$
$$= 350$$

....
(2)

The Maths Society

14. The cost in pounds, C, of hiring a car is given by

$$C = 25d + 45$$

where d is the number of days the car is hired.

(a) Find C if d = 4

$$C = 100 + 45$$
$$= 145$$

....
(2)

(b) Find d if C = 245

$$245 = 25d + 45$$
$$200 = 25d$$
$$d = 8$$

....
(2)

15. $W = 2x + 5y$

(a) Work out the value of W when $x = 8$ and $y = -3$

$$W = 16 - 15$$
$$= 1$$

....
(2)

(b) Work out the value of x when $W = 59$ and $y = 7$

$$59 = 2x + 35$$
$$2x = 24$$
$$x = 12$$

....
(2)

The Maths Society

16. The amount of medicine, s ml, to give to a puppy, up to 18 months old, can be worked out using the formula.

$$s = \frac{am}{18}$$

s is the amount of medicine, in ml.
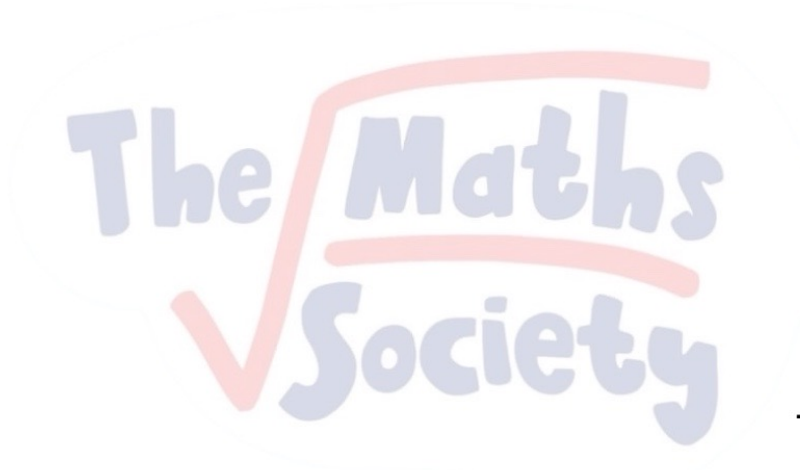a is the dose for an adult dog, in ml.
m is the age of the puppy, in months.

A puppy is 3 months old.
An adult dog's dose is 45ml.

Work out the amount of medicine the puppy should be given.

$$s = \frac{45 \times 3}{18} = 7.5$$

........................ml

(3)

17.

$$m = abc$$

Find m if $a = 3, b = -8$ and $c = 2$

$$m = 3 \times -8 \times 2$$
$$= -48$$

....

(2)

18. Heidi is a plumber.
She uses this formula to work out the cost to charge her customers.

$$C = 40h + p + 0.5d$$

C is the total cost of the job, in pounds.
h is the number of hours worked.
p is the cost of any parts used, in pounds.
d is the distance travelled, in miles.

Heidi's last job took 3 hours and the cost of the parts used was £17.50
The total cost of the job was £156

Work out how far Heidi travelled in miles.

$$156 = 120 + 17.5 + 0.5d$$
$$18.5 = 0.5d$$
$$d = 37$$

........................miles

(3)

19. $x + 3 = 10$

Work out the value of $\dfrac{5x - 3}{4}$

$$x = 7$$

$$\frac{5 \times 7 - 3}{4} = \frac{35 - 3}{4} = \frac{32}{4} = 8$$

....

The Maths Society

(2)

20. $v = u + at$

(a) Work out v when $u = 23$, $a = 4$ and $t = 3$

$$V = 23 + 12$$
$$= 35$$

....

(2)

(b) Work out u when $v = 30$, $a = 2$ and $t = 8$

$$u = 30 - 16$$
$$= 14$$

....

(2)

(c) Work out t when $v = 40$, $u = 12$ and $a = 4$

$$\frac{v - u}{a} = \frac{40 - 12}{4} = 7$$

....

(2)

21. $2x - y = 17$ ×3

(a) Work out the value of $6x - 3y$

$$6x - 3y = 51$$

....

(2)

(b) Work out the value of $y - 2x$

$$y - 2x = -17$$

....

The Maths Society   **(1)**

© Corbettmaths 2022

22. $y = 7x^2$

Explain what happens to the value of y when the value of x doubles.

.... times 4 .... $y = 7 \times (4x^2)$ ....

....

(2)

23. $y = \dfrac{800}{x^3}$
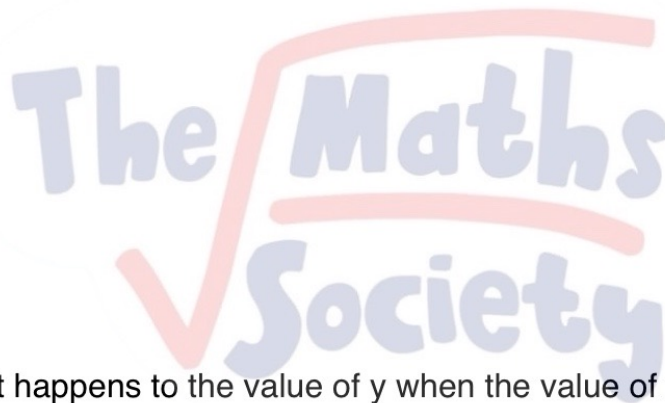
Explain what happens to the value of y when the value of x doubles.

.... $y = \dfrac{800}{(8x^3)}$ ....

....

(2)

24. Calculate the value of $x^y - y^x$

when $x = 3$ and $y = 6$

$$3^6 - 6^3 = 513$$

....

The Maths Society   **(2)**

25. $80 = 2mn$

m and n are negative integers.

Write down a pair of possible values for m and n.

mn = 40

-8 × -5
-4 × -10
-2 × -20

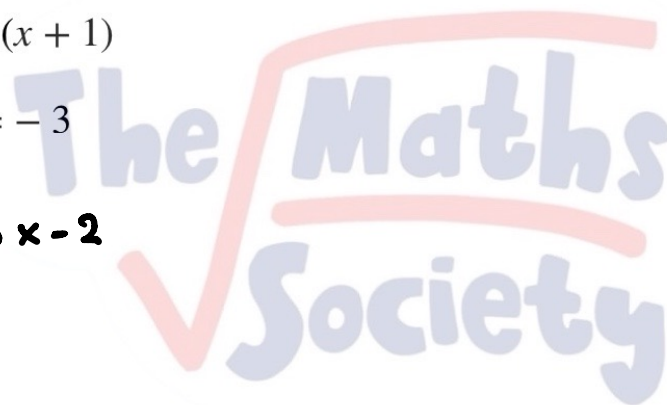m = ... and   n = ...

(2)

26. $y = (x - 5)(x + 1)$

Find y if $x = -3$

y = -8 × -2

= 16

....

(2)

The Maths Society

27. $w = \dfrac{x}{2y}$

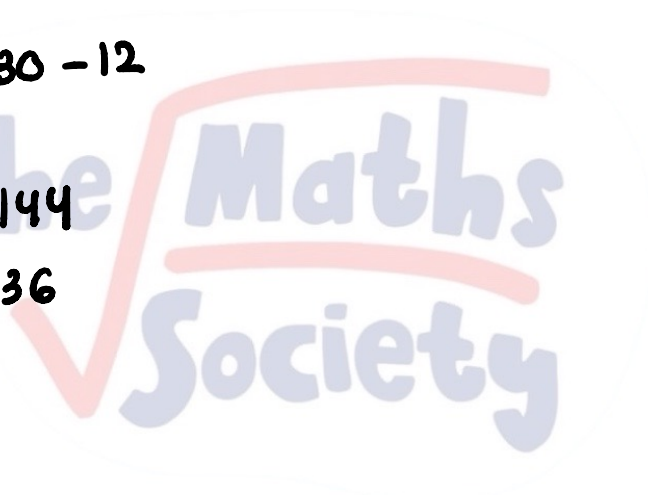$4w + 3y = 30$

Work out the value of x when $y = 4$

$4w = 30 - 3y$

$4 \times \dfrac{x}{2y} = 30 - 3y$

$\dfrac{4x}{2y} = 30 - 3y$

$\dfrac{4x}{8} = 30 - 12$

$4x = 144$

$x = 36$

....
(3)