Name:

Section:

ALGEBRAIC MANIPULATION WORKSHEET

1 $v = 3 - 5t$

Work out the value of v when $t = 4$.

$v =$ ..... [1]

[Total: 1]

2 Simplify.

$3x - 4x + 7x$

..... [1]

[Total: 1]

3 Simplify.

$4a - 3b + 5a + 6b$

..... [2]

[Total: 2]

4 Simplify.

$5f + 7g - 8f + 2g$

..... [2]

[Total: 2]

5 Solve.

$3w - 7 = 32$

$w =$ ..... [2]

[Total: 2]

6 $h = 5m - 2n$

Calculate h when $m = 4$ and $n = -6$.

..... [2]

[Total: 2]

7 Find the value of $7x + 3y$ when $x = 12$ and $y = -6$.

..... [2]

[Total: 2]

8 Solve the equation $8x - 5 = 7$.

$x =$ ..... [2]

[Total: 2]

9 Complete these statements.

(a) When $w =$ ..... , $10w = 70$. [1]

(b) When $5x = 15$, $12x =$ ..... [1]

[Total: 2]

10 Simplify.

$7g - g + 2g$

..... [1]

[Total: 1]

11 Simplify.

$1 - 2u + u + 4$

Answer ..... [2]

[Total: 2]

12 Solve $5x - 7 = 10$.

Answer $x =$ ..... [2]

[Total: 2]

13 Expand the brackets and simplify.

$5(x - 3) - 3(x - 5)$

Answer ..... [2]

[Total: 2]

14 Find the value of $5x^2$ when $x = -4$.

Answer ..... [2]

[Total: 2]

15 The four sector angles in a pie chart are $2x°$, $3x°$, $4x°$ and $90°$.

Find the value of x.

Answer $x =$ ..... [2]

[Total: 2]

16 Find the value of $3a - 5b$ when $a = -4$ and $b = 2$.

Answer ..... [2]

[Total: 2]

17 $v = 3 - 5t$

Make t the subject of the formula.

$t =$ ..... [2]

[Total: 2]

18 Joe thinks of a number, n, trebles it, and subtracts 5.
The result is 22.

Write this as an equation in terms of n, and solve the equation.

$n =$ ..... [3]

[Total: 3]

19 Simplify.

$3\,(2a - b) - b$

..... [2]

[Total: 2]

20 Factorise completely.

$18px - 27p$

..... [2]

[Total: 2]

21 Simplify.

$6\,(2x + 1) - 5\,(x - 2)$

..... [2]

[Total: 2]

22 Solve.

$$\frac{3w}{16} - 1 = \frac{1}{2}$$

$w =$ ..... [2]

[Total: 2]

23 Solve.

$10 - 3p = 3 + 11p$

$p =$ ..... [2]

[Total: 2]

24 Expand and simplify.

$4(x - 5) - (3 - 2x)$

..... [2]

[Total: 2]

25 Expand and simplify.

$(x + 3)(x - 5)$

..... [2]

[Total: 2]

26 Factorise completely.

$12a^3 - 21a$

..... [2]

[Total: 2]

27 Factorise completely.

$1 - q - a + aq$

..... [2]

[Total: 2]

28 $x^2 + 8x + 10 = (x + p)^2 + q$

(a) Find the value of p and the value of q.

$p =$ .....

$q =$ ..... [2]

(b) Solve.

$x^2 + 8x + 10 = 30$

$x =$ ..... or $x =$ ..... [2]

[Total: 4]

29 Factorise completely.

$5x^2 - 20y^2$

..... [3]

[Total: 3]

30 Simplify.

$$\frac{5x - x^2}{25 - x^2}$$

..... [3]

[Total: 3]

31 Factorise completely.

$2m + 3p - 8km - 12kp$

..... [2]

[Total: 2]

32 Make m the subject of the formula.

$mc^2 - 2k = mg$

$m =$ ..... [3]

[Total: 3]

33 Solve.

$$\frac{1}{x-3} + \frac{4}{2x+3} = 1$$

$x =$ ..... or $x =$ ..... [5]

[Total: 5]

34 Expand and simplify.

$(2x - 3)\,(x + 6)\,(x - 4)$

..... [3]

[Total: 3]

35 Write as a single fraction in its simplest form.

$$\frac{3}{x-5} - \frac{7}{2x}$$

..... [3]

[Total: 3]

36 Solve.

$$\frac{13 - 4x}{3} = 6 - x$$

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

[Total: 3]

37 Make g the subject of the formula.

$$M = \frac{2fg}{g - c}$$

$g =$ ..... [4]

[Total: 4]

38 Simplify.

$$\frac{4x^2 - 16x}{x^2 - 16}$$

..... [3]

[Total: 3]

39 Solve.

$$\frac{1}{x+1} + \frac{9}{x+9} = 1$$

$x =$ ..... or x = ... [5]

[Total: 5]

40 Simplify.

$$\frac{2x^2 - 5x - 12}{3x^2 - 12x}$$

..... [4]

[Total: 4]