

Name:

Section:

ALGEBRAIC MANIPULATION WORKSHEET

1 $v = 3 - 5t$

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

$v = \dots\dots\dots$ [1]

[Total: 1]

2 Simplify.
 $3x - 4x + 7x$

$\dots\dots\dots$ [1]

[Total: 1]

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

$\dots\dots\dots$ [2]

[Total: 2]

4 Simplify.
 $5f + 7g - 8f + 2g$

$\dots\dots\dots$ [2]

[Total: 2]

5 Solve.
 $3w - 7 = 32$

$w = \dots\dots\dots$ [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 $2x^\circ$, $3x^\circ$, $4x^\circ$ and 90° .

Find the value of x .

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

[Total: 2]

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

Answer $\dots\dots\dots$ [2]

[Total: 2]

- 17 $v = 3 - 5t$

Make t the subject of the formula.

$t = \dots\dots\dots$ [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.

$$n = \dots\dots\dots [3]$$

[Total: 3]

- 19** Simplify.

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

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

[Total: 2]

- 20** Factorise completely.

$$18px - 27p$$

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

[Total: 2]

- 21** Simplify.

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

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

[Total: 2]

22 Solve.

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

$$w = \dots\dots\dots [2]$$

[Total: 2]

23 Solve.

$$10 - 3p = 3 + 11p$$

$$p = \dots\dots\dots [2]$$

[Total: 2]

24 Expand and simplify.

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

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

[Total: 2]

25 Expand and simplify.

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

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

[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 .

$$p = \dots\dots\dots$$

$$q = \dots\dots\dots [2]$$

(b) Solve.

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

$$x = \dots\dots\dots \text{ or } x = \dots\dots\dots [2]$$

[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.

$$mc^2 - 2k = mg$$

$$m = \dots\dots\dots [3]$$

[Total: 3]

33 Solve.

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

$$x = \dots\dots\dots \text{ or } x = \dots\dots\dots [5]$$

[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.

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

$$g = \dots\dots\dots [4]$$

[Total: 4]

38 Simplify.

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

$$\dots\dots\dots [3]$$

[Total: 3]

39 Solve.

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

$$x = \dots\dots\dots \text{ or } x = \dots\dots\dots \quad [5]$$

[Total: 5]

40 Simplify.

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

$$\dots\dots\dots \quad [4]$$

[Total: 4]