

Name _____

Date _____

Stage 7 End-of-unit test 2 — mark scheme

25 questions · 40 marks · calculators are not allowed · allow about 45 minutes

- 1 Write an expression for: 5 more than n . [1]

Answer: $n + 5$ “More than” means add, so the answer is $n + 5$.

- 2 Write an expression for: x less than y . [1]

Answer: $y - x$ “ x less than y ” means start at y and take x away: $y - x$. The order matters.

- 3 Work out the value of $3x + 2$ when $x = 7$. [1]

Answer: 23 $3 \times 7 + 2 = 21 + 2 = 23$.

- 4 Work out the value of $5x - 2$ when $x = -3$. [2]

Answer: -17 $5 \times (-3) = -15$, then $-15 - 2 = -17$.

- 5 Simplify: $6x + 3y - 2x + y$. [2]

Answer: $4x + 4y$ x terms: $6x - 2x = 4x$. y terms: $3y + y = 4y$. Answer $4x + 4y$.

- 6 Simplify: $5a + 7 - 2a - 3$. [2]

Answer: $3a + 4$ $3a + 4$.

- 7 Expand: $4(n + 3)$. [1]

Answer: $4n + 12$ $4 \times n + 4 \times 3 = 4n + 12$.

- 8 Expand: $3(2g + h - 7)$. [2]

Answer: $6g + 3h - 21$ $6g + 3h - 21$ — every term inside is multiplied by 3.

- 9 Expand and simplify: $2(x + 4) + 3(x + 1)$. [2]

Answer: $5x + 11$ $2x + 8 + 3x + 3 = 5x + 11$.

- 10 Solve: $x - 3 = 12$. [1]

Answer: 15Add 3 to both sides: $x = 15$. Check: $15 - 3 = 12$ ✓

- 11 Solve: $2y + 4 = 16$. [2]

Answer: 6Subtract 4: $2y = 12$. Divide by 2: $y = 6$. Check: $2 \times 6 + 4 = 16$ ✓

- 12 Solve: $4(x - 2) = 20$. [2]

Answer: 7

Divide both sides by 4: $x - 2 = 5$, so $x = 7$.

- 13 Solve: $5x + 3 = 3x + 11$. [2]

Answer: 4

Subtract $3x$ from both sides: $2x + 3 = 11$, so $2x = 8$ and $x = 4$.

- 14 Write in words what $x < -4$ means. [1]

Answer: x is less than -4

The symbol $<$ means "is less than".

- 15 What is the smallest integer that satisfies $x > 7$? [1]

Answer: 8

The symbol is strict, so 7 itself is not allowed. The smallest integer is 8.

- 16 What is the largest integer that satisfies $y < -2$? [1]

Answer: -3

-2 is not allowed, so the largest integer is -3 .

- 17 List all the integers that satisfy both $x > -3$ and $x < 2$. [2]

Answer: -2, -1, 0, 1

Start just above -3 and stop just below 2.

- 18 Write a formula for the perimeter P of a rectangle with length l and width w . Give the right-hand side only. [2]

Answer: $2l + 2w$

There are two lengths and two widths: $P = 2(l + w) = 2l + 2w$.

- 19 Using $P = 2(l + w)$, a rectangle has $P = 30$ cm and $l = 9$ cm. Work out w , in cm. [2]

Answer: 6

$2(9 + w) = 30 \rightarrow 9 + w = 15 \rightarrow w = 6$ cm.

- 20 A rectangle has width x cm and length four times its width. Write a simplified expression for its perimeter, in cm. [2]

Answer: $10x$

Perimeter $= 2(x + 4x) = 2 \times 5x = 10x$.

- 21 The angles of a triangle are x , $2x$ and $3x$ degrees. Find x . [2]

Answer: 30

$6x = 180$, so $x = 30^\circ$.

- 22 A taxi charges \$3 plus \$2 per kilometre. A journey cost \$23. How many kilometres was it? [2]

Answer: 10

$2k + 3 = 23 \rightarrow 2k = 20 \rightarrow k = 10$ km.

- 23 How many terms are there in the expression $4x + 3y - 7$? [1]

Answer: 3

The terms are $4x$, $3y$ and -7 .

24 Which pair are like terms? [1]

- ☐ $3x$ and $3y$
- ☐ $5a$ and $2a$
- ☐ $4p$ and 4
- ☐ $2m$ and m^2

Answer: 5a and 2a

Like terms have exactly the same letter to the same power.

25 Three consecutive integers add up to 42. What is the smallest one? [2]

Answer: 13

$3n + 3 = 42 \rightarrow 3n = 39 \rightarrow n = 13$ (the numbers are 13, 14, 15).

Total: 40 marks