

Y8 Maths

Unit 2 Test

Working with Powers

Name: markscheme

CALCULATOR ALLOWED

TOTAL 43

1 Simplify

a $6x + 4 - 2x - 7$

$\overbrace{4x}^{B1} - \overbrace{3}^{B1}$

b $2y^2 + 3y + y^2 + 6$

$\overbrace{3y^2}^{B1} + \overbrace{3y + 6}^{B1}$
(4 marks)

2 Expand these brackets.

a $4(2m - 3)$

$\overbrace{8m}^{B1} - \overbrace{12}^{B1}$

b $p(3p + 5)$

$\overbrace{3p^2}^{B1} + \overbrace{5p}^{B1}$
(4 marks)

3 Simplify

a $t^2 \times t$

$\textcircled{B1} \quad t^3$

b $\frac{m^4}{m}$

$\textcircled{B1} \quad m^3$
(2 marks)

4 Expand and simplify fully

a $4k^2 + 2k(3 - k) = 4k^2 + 6k - 2k^2$

$\textcircled{B1} \text{ for } +6k \pm 2k^2$

$\textcircled{B1}$

$2k^2 + 6k$

b $4(x + 2y) + 3(y - x)$

$= 4x + 8y + 3y - 3x$

$\textcircled{B1} \text{ for 3 terms correct}$

$x + 11y$ $\textcircled{B1}$

(4 marks)

5 a Which one of these equations should have $\equiv$ instead of $=$?

A $5v - 7 = 4 + 2v - 3$

B $r(r + 2) = r^2 + 2r$

B (B1)

b What is the name of this symbol $\equiv$ and what does it mean?

(B1) for identity/identical/identically equal to

(C1) for words or examples which are clearly trying to indicate that identities are true for all values of the variable

(3 marks)

6 Fully factorise these expressions.

a $2d^2 - 7d$

(B1) (B1)
 $d(2d - 7)$

b $pq + pq^2 - p^2q$

Special Case

- $p(q + q^2 - pq)$
- $q(p + pq - p^2)$

Award B0 B1

(B1) (B1)
 $pq(1 + q - p)$

(4 marks)

7 Substitute $x = -5$ into these terms.

a x^2

(B1) 25

b $2x$

(B1) -10

c $2x^2$

(B1) 50

d $(2x)^2$

(B1) 100

(4 marks)

8 Simplify

a $n^4 \times n^3$

(B1) n^7

b $c^{10} \div c^3$

(B1) c^7

(2 marks)

9 Solve the equation.

$$3(2x - 1) - 4(x + 2) = 0$$

$$6x - 3 - 4x - 8 = 0$$

(M1) for expanding brackets and 3 terms correct

$$2x = 11$$

(M1) for isolating terms i.e. x from numbers

(A1)

$$x = 5.5$$

(3 marks)

10 The formula $s = \frac{v^2 - u^2}{2a}$ can be used to find the height of a ball (s metres) which has been projected into the air.

Find s when $u = 21$, $v = 0$ and $a = -9.8$

$$s = \frac{0^2 - 21^2}{2 \times -9.8} = \frac{-441}{-19.6}$$

(M1) for substituting all three numbers correctly

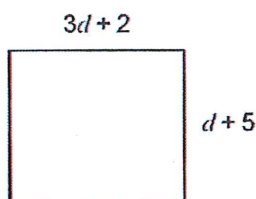
(M1) for simplifying numerator and denominator

(A1)

$$22.5 \text{ m}$$

(3 marks)

11 The diagram shows a rectangle with length $(3d + 2)$ cm and width $(d + 5)$ cm.



a Write an expression for the perimeter of the rectangle.

$2(d+5) + 2(3d+2)$ (B1) for any correct expression
(it does not have to be simplified)

b Given that the perimeter is 30 cm, make and solve an equation to find d .

$2(d+5) + 2(3d+2) = 30$ (M1) for equating their expression in
 $2d + 10 + 6d + 4 = 30$ (a) to 30
 $8d + 14 = 30$
 $8d = 16$ (M1) for isolating
 terms in d
 from numbers
 $d = 2$ (A1)

(4 marks)

12 Simplify

a $(5a^3)^2$

$25a^6$

b $\frac{35b^{10}}{7b^2}$

$5b^8$

c $\left(\frac{c^3}{3}\right)^3$

(B1) $\rightarrow \frac{c^9}{27}$

(6 marks)

[End of Test]