

Factorising, Simplifying and Indices

1. (a) Simplify the expression

$$2c + 6d + 4c - 8c$$
$$-2c + 6d$$

Answer $-2c + 6d$

(2)

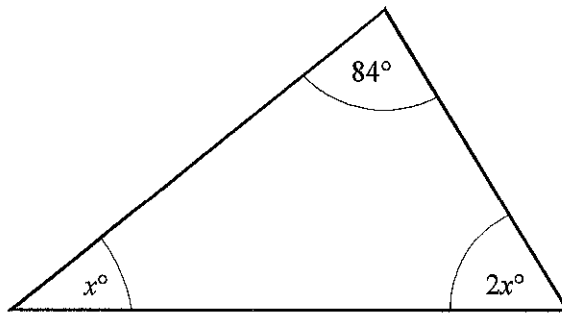
- (b) Factorise $x^2 + 5x$

$$x(x + 5)$$

Answer $x(x + 5)$

(2)

- (c) The triangle has angles x° , $2x^\circ$ and 84° as shown.
Find the value of x .



Not drawn accurately

$$x + 2x + 84 = 180$$

$$3x + 84 = 180$$

$$3x = 96$$

$$x = \underline{\underline{32}}$$

Answer degrees

(3)

(Total 7 marks)

2. (a) Factorise $3x - 6$

$$3(x - 2)$$

Answer $3(x - 2)$

(1)

- (b) Factorise $x^2 - 2x$

Answer $x(x - 2)$

(2)

(Total 3 marks)

3. (a) Factorise $4x - 12$

$4(x - 3)$

Answer $4(x - 3)$

(1)

(b) Factorise $x^2 - 5x$

Answer $x(x - 5)$

(1)

(Total 2 marks)

4. Factorise

(a) $4x - 8$

$4(x - 2)$

Answer.....

(1)

(b) $y^2 + 2y$

$y(y + 2)$

Answer.....

(2)

(Total 3 marks)

5. (a) Expand $d(d^2 + 6)$

Answer $d^3 + 6d$

(2)

(b) Simplify

$g^4 \times g^4$

g^8

$g \times g \times g \times g \times g \times g \times g \times g$

Answer g^8

(1)

(c) Expand and simplify

$2(p + 5) + 3(2p - 1)$

$2p + 10 + 6p - 3$

$8p + 7$

Answer $8p + 7$

(2)

(Total 5 marks)

6. (a) Factorise completely $12y^2 - 8y$

$$\underline{\underline{4y(3y-2)}}$$

Answer

(2)

(b) Simplify $(2xy^2)^3 = 2^3 x^3 (y^2)^3$

$$(y^2)^3 = y^2 \times y^2 \times y^2$$

$$= y \times y \times y \times y \times y \times y$$

$$\underline{\underline{= 8x^3y^6}}$$

Answer

(2)

(Total 4 marks)

7. (a) Multiply out and simplify

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

$$4x - 8 + 3x + 6$$

$$\underline{\underline{x - 2}}$$

Answer

(2)

(b) Factorise completely the following expressions

(i) $2a^2 + a$

$$\underline{\underline{a(2a+1)}}$$

Answer

(1)

(ii) $8x^3y^2 - 4xy^3$

$$\underline{\underline{4xy^2(2x^2 - y)}}$$

Answer

(2)

(Total 5 marks)

8. (a) Factorise $2x + 6$

$$\underline{\underline{2(x+3)}}$$

Answer

(1)

(b) Expand $3(4y+1)$

$$\underline{\underline{12y + 3}}$$

Answer.....

(1)

(c) Expand $4x(x^2+5)$

$$\underline{\underline{4x^3 + 20x}}$$

Answer.....

(2)

(Total 4 marks)

9. Simplify

(a) $m^2 \times m^5 = m^{2+5}$

Answer m^7

(1)

(b) $p^6 \div p^3 = p^{6-3}$

Answer p^3

(1)

(c) $(q^4)^2 = q^{4 \times 2}$

Answer q^8

(1)

(Total 3 marks)

10. (a) Factorise $10p-4$

$$\underline{\underline{2(sp-2)}}$$

Answer.....

(1)

(b) Factorise q^2+3q

$$\underline{\underline{q(q+3)}}$$

Answer.....

(1)

(c) Factorise r^2-r

$$\underline{\underline{r(r-1)}}$$

Answer

(1)

(d) Simplify $t^2 \times t^3$

.....

Answer t^5

(1)

(Total 4 marks)

11. (a) Simplify

$$4x - 5x + 7x$$

.....

Answer $6x$

(b) Simplify

(i) $x^5 \times x^{-2} = x^{5-2}$

$x^{-2} = \frac{1}{x^2} \rightarrow \frac{x^5}{x^2}$

(1)

.....

Answer x^3

(ii) $y^5 \div y^{-2} = y^{5-(-2)}$

$y^5 \div \frac{1}{y^2} = y^5 \times y^2$

.....

Answer y^7

(1)

(Total 3 marks)

12. (i) Factorise completely $2a^2 - a$

$a(2-a)$

.....

Answer

(ii) Find the value of $2a^2 - a$ when $a = -4.5$

$2 \times (-4.5)^2 - (-4.5)$
 $= 2 \times 20.25 + 4.5$

Answer 45

be careful: $-4.5^2 = 20.25$
(positive)

(2)

(c) Simplify

(i) $x^5 \times x^{-2}$

.....

Answer x^3

(1)

(ii) $y^5 \div y^{-2}$

Answer y^7

(1)
(Total 9 marks)

13. (a) Simplify $2x + 3y + 5x - 2y - 4x$

$3x + y$

Answer

(2)

(b) Factorise $4c + 12$

$4(c + 3)$

Answer

(1)

(c) Factorise $x^2 + 5x$

$x(x + 5)$

Answer

(2)

(Total 5 marks)

14. Simplify

(a) $w^6 \times w^2$

Answer w^8

(1)

(b) $x^3 \div x^5 = \frac{x^3}{x^5}$

Answer x^{-2} or $\frac{1}{x^2}$

(1)

(c) $(y^3)^2 = y^{3 \times 2}$

Answer y^6

(1)

(Total 3 marks)