Simplifying algebra

Exam Style Questions

1. Simplify the following

(a) $7x + 2y + 4x + 8y$

$11x + 10y$ (1 mark)

(b) $12a + 2b + 20a + 9b$

$32a + 11b$ (1 mark)

(c) $6 + 2x + 3 + 12x$

$14x + 9$ (1 mark)

(d) $4a + 4ab + 3ab + b$

$4a + 7ab + b$ (1 mark)

(e) $x^2 + x^2$

$2x^2$ (1 mark)

(f) $3a^2 + 2a^2$

$5a^2$ (1 mark)

(g) $4x^3 + x^2 + 8x^3$

$12x^3 + x^2$ ..... (1 mark)

(h) $5x^6 + y^2 + x^6 + 5y^2$

$6x^6 + 6y^2$ ..... (1 mark)

(i) $-4a + 3b + 2a - 8b + b$

$-2a - 4b$ ..... (1 mark)

(i) $2x - y + 6x - 3y$

$8x - 4y$ ..... (1 mark)

(j) $-20x + 4y - 3x - 4y$

$-23x$ ..... (1 mark)

(k) $11ab - 3ab + 5ac - 9ac$

$8ab - 4ac$ ..... (1 mark)

(l) $4xyz - 8 + 6xyz - 13 - 2xyz$

$8xyz - 21$ ..... (1 mark)

(m) $-18x - 2y + 3z + x$

-17x - 2y + 3z ..... (1 mark)

(n) $a + a + a + a + a$

5a ..... (1 mark)

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2. Simplify the following

(a) $x \times y$

xy ..... (1 mark)

(b) $3a \times 2b$

6ab ..... (1 mark)

(c) $9x \times 3y$

27xy ..... (1 mark)

(d) $x \times x$

x^2 ..... (1 mark)

(e) $2x \times 3x$

$6x^2$ (1 mark)

(f) $-2a \times 5a$

$-10a^2$ (1 mark)

(g) $-6x \times -3y$

$18xy$ (1 mark)

(h) $2xy \times 3xy$

$6x^2y^2$ (1 mark)

(i) $x \times y \times z$

xyz (1 mark)

(i) $a \times 3b \times c$

$3abc$ (1 mark)

(j) $2x \times 3y \times 4y$

$24xy^2$ (1 mark)

(k) $-x \times -x$

x^2 ..... (1 mark)

(l) $2xy \times 7x$

$14x^2y$ ..... (1 mark)

(m) $abc \times 2a$

$2a^2bc$ ..... (1 mark)

(n) $5s \times -3$

$-15s$ ..... (1 mark)

(n) $a^2 \times a$

a^3 ..... (1 mark)

3. Simplify the following

(a) $\frac{2a}{a}$

2 …….. (1 mark)

(b) $\frac{16x}{20xy}$

$\frac{4}{5y}$ …….. (1 mark)

(c) $\frac{15x^2}{x}$

15x …….. (1 mark)

(d) $\frac{30y^3}{3y^2}$

10y …….. (1 mark)

(e) $\frac{x(x+2)}{2x}$

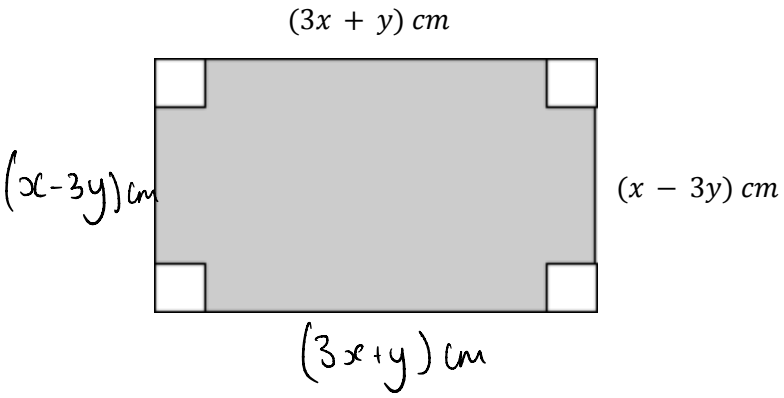
$\frac{x+2}{2}$ …….. (1 mark)

(f) $\frac{8abc}{16abd}$

$\frac{c}{2d}$ …….. (1 mark)

4. For each of the following shapes, find an expression for the perimeter.
   Give your answers in simplest form.

(a)

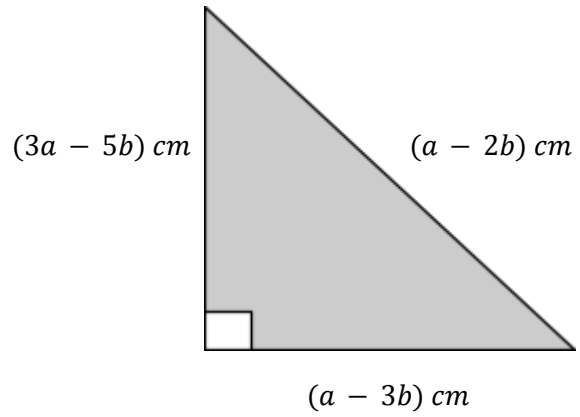


$3x+y+x-3y+3x+y+x-3y$

$= 8x-4y$

Perimeter = $8x-4y$ cm (1)

(b)



$3a-5b+a-2b+a-3b$

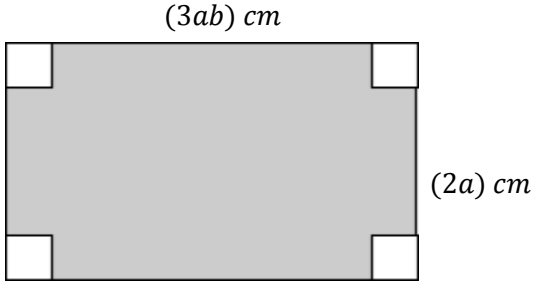
$= 5a-10b$

Perimeter = $5a-10b$ cm (1)

(2 marks)

5. For the following shapes, find an expression for the area.

(a)



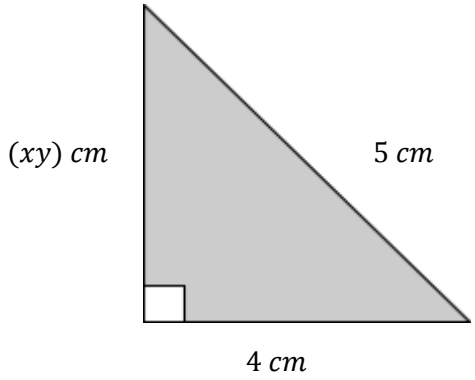
$A = bh$

$= 3ab \times 2a$

$= 6a^2b$

Area = $6a^2b$ cm^2 (1)

(b)



$A = \frac{1}{2}bh$

$= \frac{1}{2} \times 4 \times xy = 2xy$

Area = $2xy$ cm^2 (1)

(2 marks)
