

**Exercise WS2.1**

1. Write in their simplest forms:
  - (a)  $3a - a + 11a$
  - (b)  $a + 2b - 5a - (-b)$
  - (c)  $3x + 4xy - xy$
  
2. Re-write the following without using the ' $\times$ ' and ' $\div$ ' signs, and express each in terms of  $x$ ,  $y$  and  $z$  when  $a = 2$ ,  $b = 3$  and  $c = -4$ :
  - (a)  $ax \times by$
  - (b)  $a \times (-4b)$
  - (c)  $(-4x) \div (-2y) \times (-z)$

**Exercise WS2.2**

1. Multiply out, and simplify:
  - (a)  $a(3b + c) - 2ab$
  - (b)  $4u - (v + 2 - w)$
  - (c)  $-x(3 + 2y) + 3(x - 2y)$
  
2. Factorise the following, where possible:
  - (a)  $3x + xy$
  - (b)  $ay + 2ax$
  - (c)  $bxy - 2x + 10y$
  - (d)  $9u + 3v - 12w$

**Exercise WS2.3**

1. Express each of the following as a single algebraic fraction:
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(a)  $\frac{1}{a} + \frac{1}{b}$

(b)  $\frac{3a}{c} + \frac{c}{b}$

(c)  $\frac{1}{a+b} + \frac{b}{b+c}$

(d)  $\frac{a-b}{a+b} + \frac{a+b}{a-b}$

2. Express each of the following as a single algebraic fraction, and simplify where possible:

(a)  $\frac{1}{a} \times \frac{b}{c}$

(b)  $\frac{a}{b} \div \frac{b}{c}$

(c)  $\frac{1}{x+1} \times \frac{y}{z}$

#### Exercise WS2.4

1. Simplify where possible:

(a)  $(-a)^2$ ;  $(-a)^3$ ;  $(-a)^4$ ;  $(-a)^5$

(b)  $\left(\frac{b}{2}\right)^2$ ;  $\frac{a^2}{b^2}$ ;  $\frac{-x^2}{(-y)^2}$ ;  $\frac{(-x)^3}{-y}$

(c)  $2xy^2 \div 3x^2y$

2. Remove the brackets from the following:

(a)  $(xy)^2$

(b)  $(x^2y)^{\frac{1}{2}}$

(c)  $(x^{-2}y^{\frac{1}{2}})^{-1}$

(d)  $\left(\frac{x^{-2}}{y^{\frac{1}{2}}}\right)^2$