

# Reference sheet

$$\frac{a}{b} + \frac{c}{b} = \frac{a+c}{b}$$

$$\frac{a}{b} + \frac{c}{d} = \frac{ad+bc}{bd}$$

$$\frac{a}{b} - \frac{c}{d} = \frac{ad-bc}{bd}$$

$$\frac{a}{b} \times \frac{c}{d} = \frac{ac}{bd}$$

$$\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \times \frac{d}{c} = \frac{ad}{bc}$$

$$x^n = \underbrace{x \times x \times \dots \times x}_{n \text{ times}}$$

$$x^m x^n = x^{m+n}$$

$$\frac{x^m}{x^n} = x^{m-n}$$

$$(x^m)^n = x^{mn}$$

$$x^{-n} = \frac{1}{x^n}$$

$$(xy)^n = x^n y^n$$

$$x(y+z) = xy + xz$$

$$(x+y)^2 = x^2 + 2xy + y^2$$

$$(x-y)^2 = x^2 - 2xy + y^2$$

$$x^2 - y^2 = (x+y)(x-y)$$

$$x^3 + y^3 = (x+y)(x^2 - xy + y^2)$$

$$x^3 - y^3 = (x-y)(x^2 + xy + y^2)$$

$$\frac{2}{4} + \frac{1}{4} = \frac{3}{4}$$

$$\frac{2}{3} + \frac{1}{4} = \frac{11}{12}$$

$$\frac{2}{3} - \frac{1}{4} = \frac{5}{12}$$

$$\frac{2}{3} \times \frac{1}{4} = \frac{2}{12} = \frac{1}{6}$$

$$\frac{2}{3} \div \frac{1}{4} = \frac{2}{3} \times \frac{4}{1} = \frac{8}{3}$$

$$5^4 = 5 \times 5 \times 5 \times 5$$

$$5^4 5^3 = 5^7$$

$$\frac{5^4}{5^3} = 5^1 = 5$$

$$(5^4)^3 = 5^{12}$$

$$2^{-3} = \frac{1}{8}$$

$$(ab)^3 = a^3 b^3$$

$$\begin{aligned} a(2b+3c) &= 2ab + 3ac \\ -2a(3b+4c) &= -6ab - 8ac \end{aligned}$$

$$(a+3)^2 = a^2 + 6a + 9$$

$$(a-3)^2 = a^2 - 6a + 9$$

$$a^2 - 4 = (a+2)(a-2)$$

$$8a^3 + 27 = (2a+3)(4a^2 - 6a + 9)$$

$$8a^3 - 27 = (2a-3)(4a^2 + 6a + 9)$$