

1 Substitution

- a) Work out $\frac{p^2-3q}{2p}$ when $p = -3$ and $q = 5$.
- b) $v^2 = u^2 + 2as$. Find the positive value of v when $u = 5$, $a = 3$ and $s = 4$.

$$a) \frac{9-15}{-6} = 1$$

$$b) v^2 = 25 + 24 = 49, v = 7$$

2 Rearranging formulae

- a) Make h the subject of $A = \frac{1}{2}(a+b)h$.
- b) Make x the subject of $y = 3\sqrt{x-2}$.

$$a) 2A = (a+b)h, h = \frac{2A}{a+b}$$

$$b) \sqrt{x} = \frac{y+2}{3}, x = \left(\frac{y+2}{3}\right)^2$$

3 The subject appears twice

- a) Make p the subject of $5p - q = 2pr + 3$.
- b) Make x the subject of $a(x-2) = b(x+3)$.

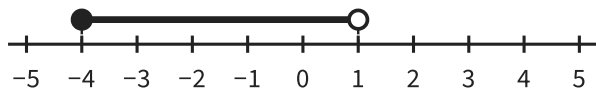
$$a) 5p - 2pr = q + 3, p = \frac{q+3}{5-2r}$$

$$b) ax - bx = 2a + 3b$$

$$x = \frac{2a+3b}{a-b}$$

4 Inequalities on a number line

- a) Write the inequality in x that the number line shows.
- b) List the integers n on the line with $2n + 5 > 0$.



$$a) -4 \leq x < 1$$

$$b) n > -2.5: -2, -1, 0$$

Inequalities and formulae revision mat answers

5 Solving inequalities

Solve

- a) $3(x-4) \geq 5x+2$
- b) $-3 < 2x+5 \leq 11$

$$a) 3x - 12 \geq 5x + 2, -2x \geq 14, x \leq -7$$

$$b) -8 < 2x \leq 6$$

$$-4 < x \leq 3$$

6 Solving inequalities: forming

A square has sides of $(2x-1)$ cm. Its perimeter is at most 30 cm.

- a) Write an inequality in x and solve it.
- b) Explain why $x > 0.5$ too. Give the range of x .

$$a) 4(2x-1) \leq 30, 8x \leq 34, x \leq 4.25$$

$$b) \text{a side is more than 0: } 2x-1 > 0$$

$$0.5 < x \leq 4.25$$

7 Quadratic inequalities

Solve

- a) $x^2 + 4x - 12 \leq 0$
- b) $x^2 > 3x$

$$a) (x+6)(x-2): -6 \leq x \leq 2$$

$$b) x(x-3) > 0$$

$$x < 0 \text{ or } x > 3$$

8 Using the formulae sheet

Use the formula for the volume of a cone from your formulae sheet. Give your answers to 1 decimal place.

- a) A cone has radius 4 cm and height 9 cm. Find its volume.
- b) Another cone has volume 100 cm^3 and radius 3 cm. Find its height.

$$a) \frac{1}{3} \times \pi \times 4^2 \times 9 = 48\pi = 150.8 \text{ cm}^3$$

$$b) 3\pi h = 100, h = 10.6 \text{ cm}$$