A Number skills: Mental calculation

Skill 1.5

Calculate by splitting the numbers into useful parts:

1 (a) 23×2000 (b) 250×1000 (c) 4.2×2000 (d) 30×2000

(e) 1600×0.5 (f) $\frac{1}{3}$ of 12.12 (g) $\frac{3}{4}$ of 12.12 (h) $\frac{2}{5}$ of 50 kg

(i) $\frac{1}{5}$ of 150 t (j) $\frac{16}{56}$ (k) $1.9 \times 200\,000$ (l) 1.02×200

2 (a) $6\frac{1}{2} - 2\frac{1}{4}$ (b) $2\frac{1}{8} + \frac{1}{4}$ (c) $5\frac{2}{3} - 4\frac{1}{3}$ (d) $6\frac{1}{4} + 2\frac{1}{4}$

(e) $6\frac{1}{4} + \frac{3}{4}$ (f) $10\frac{2}{5} + 3\frac{1}{5} + \frac{2}{5}$ (g) $5\frac{1}{4} - 2\frac{1}{2} + \frac{1}{4}$ (h) $3\frac{1}{8} + 2\frac{1}{8} + 5\frac{1}{8}$

(i) $11\frac{2}{3} + 5\frac{1}{3}$ (j) $3\frac{2}{7} + 5\frac{4}{7}$ (k) $3\frac{5}{7} - 1\frac{2}{7}$ (l) $12\frac{3}{8} - 1\frac{1}{8}$

B Number applications: Rates

Skill 2.9

1 Find the rate at which these tanks empty in litres per hour if each empties in $3\frac{1}{2}$ hours. The tanks contain:

(a) 1200 L (b) 380 L (c) 580 L (d) 6300 L
(e) 5200 L (f) 840 L (g) 3800 L (h) 94 000 L
(i) 12 000 L (j) 15 000 L

2 A steam train travels at 12 km/h. How long will it take to travel:

(a) 144 km (b) 78 km (c) 66 km (d) 15 kms
(e) 27 km (f) 88 km (g) 21 km (h) 81 km
(i) $14\frac{2}{5}$ km (j) 64 km

C Algebra: Variation

Skill 3.14

1 The distance travelled (d m) by a missile varies directly with time of flight (t s). If the missile travels 2400 m in 12 s, then find:
(a) The formula which connects the distance with the time of flight.
(b) The distance travelled in 210 seconds.
(c) The time taken to travel 3800 metres.

2 The time taken (t s) to travel a journey varies inversely with the speed of travel (v m/s). If it takes 12 seconds to complete a journey travelling at 6 m/s, find:
(a) The formula which relates the time of travel to the speed.
(b) The time taken for the journey if the speed is increased to 36 m/s.

D Indices: Solving indical equations

Skill 4.8

1 Solve these for x:
(a) $x^3 = 216$ (b) $x^4 = 81$ (c) $x^5 = 32$
(d) $x^2 = 225$ (e) $x^3 = 64$

2 Solve these to 2 decimal places by using the remove the power method:
(a) $x^4 = 3$ (b) $x^2 = 18.2$ (c) $x^5 = 1$
(d) $x^6 = 2$ (e) $x^7 = 3$

E Cartesian plane: Finding the distance between two points

Skill 5.2

Find the distance between these points using the graph construction method:

1 (0, 0) and (3, 5) **2** (1, 1) and (4, 9) **3** (4, –2) and (2, 4)
4 (–2, 3) and (2, –3) **5** (6, –3) and (–4, 3)

Worksheet 11

A 1 (a) 46 000   **(b)** 250 000   **(c)** 8400
   (d) 60 000   **(e)** 800   **(f)** $4.04
   (g) $9.09   **(h)** 20 kg   **(i)** 30 t
   (j) $\frac{2}{7}$ **(k)** 380 000   **(l)** 204

2 (a) $4\frac{1}{4}$ **(b)** $2\frac{3}{8}$ **(c)** $1\frac{1}{3}$ **(d)** $8\frac{1}{2}$
   (e) 7   **(f)** 14   **(g)** 3   **(h)** $10\frac{3}{8}$
   (i) 17   **(j)** $8\frac{6}{7}$ **(k)** $2\frac{3}{7}$ **(l)** $11\frac{1}{4}$

B 1 (a) $342\frac{6}{7}$ **(b)** $108\frac{4}{7}$ **(c)** $165\frac{5}{7}$
   (d) 1800   **(e)** $1485\frac{5}{7}$ **(f)** 240
   (g) $1085\frac{5}{7}$ **(h)** $26857\frac{1}{7}$ **(i)** $3428\frac{1}{7}$
   (j) $4285\frac{5}{7}$

2 (a) 12 hrs   **(b)** $6\frac{1}{2}$ hrs   **(c)** $5\frac{1}{2}$ hrs
   (d) $1\frac{1}{4}$ hrs   **(e)** $2\frac{1}{4}$ hrs   **(f)** $7\frac{1}{3}$ hrs
   (g) $1\frac{3}{4}$ hrs   **(h)** $6\frac{3}{4}$ hrs   **(i)** $1\frac{1}{5}$ hrs
   (j) $5\frac{1}{3}$ hrs

C 1 (a) $d = 200\,t$ **(b)** 42 000 m   **(c)** 19 s

2 (a) $t = \dfrac{72}{v}$ **(b)** 2 s

D 1 (a) 6   **(b)** 3   **(c)** 2
   (d) 15   **(e)** 4

2 (a) 1.32   **(b)** 4.27   **(c)** 1
   (d) 1.12   **(e)** 1.17

E 1 5.83   **2** 8.54   **3** 6.32
   4 7.21   **5** 11.66