

A Algebra: using the guess/check/improve method to solve equations

Skill 3.12

It is known that a solution to the equation $x^3 - 4x^2 - 14$ lies between 4.6 and 4.7. Find this solution to 2 decimal places.

B Number skills: Converting between decimals and fractions

Skill 1.1

1 Make these into percentages to 2 decimal places:

(a) $6\frac{1}{4}$

(b) $5\frac{1}{8}$

(c) $3\frac{1}{3}$

(d) $\frac{5}{7}$

(e) $2\frac{3}{7}$

(f) $11\frac{1}{4}$

(g) $9\frac{1}{5}$

(h) $5\frac{1}{9}$

(i) $6\frac{2}{9}$

(j) $11\frac{1}{3}$

(k) $5\frac{2}{7}$

(l) $9\frac{4}{9}$

2 Make these into fractions:

(a) 280%

(b) 540%

(c) 67%

(d) 68%

(e) 32.5%

(f) 93.4%

(g) 38.4%

(h) 29.6%

(i) 4.05%

(j) 135%

(k) 5.05%

(l) $16\frac{1}{2}\%$

C Number applications: Increasing or decreasing quantities in a ratio

Skill 2.4

1 If William drinks 250 mL of milk every 3 hours, then at this rate how many litres of milk will he drink in:

(a) 4 hours

(b) $6\frac{1}{2}$ hours

(c) 8 hours

(d) $9\frac{1}{4}$ hours

(e) 12 hours

2 If a flywheel in a wheat harvester turns 35 times every $1\frac{1}{2}$ minutes then how long will it take for the wheel to turn:

(a) 70 times

(b) 105 times

(c) $17\frac{1}{2}$ times

(d) $87\frac{1}{2}$ times

(e) $157\frac{1}{2}$ times

D Algebra: Solving complex quadratic equations

Skill 3.11

1 Solve these equations by completing the square, and express the solutions in surd form:

(a) $x^2 - 2x - 10 = 0$

(b) $x^2 + 4x - 13 = 0$

(c) $x^2 + 2x - 5 = 0$

(d) $x^2 - 4x + 1 = 0$

(e) $x^2 + 6x - 11 = 0$

(f) $x^2 - 6x - 20 = 0$

2 Use the general quadratic equation to solve these equations, and express the solutions in surd form:

(a) $x^2 - 2x - 5 = 0$

(b) $x^2 + 3x - 7 = 0$

(c) $x^2 + 5x - 7 = 0$

(d) $x^2 - 3x - 8 = 0$

(e) $x^2 - 4x - 11 = 0$

(f) $x^2 - x - 10 = 0$

E Cartesian plane: Finding the gradient of a line between two points

Skill 5.1

1 Find the gradient of the line between these points using the graph construction method:

(a) (0, 0) and (-3, 2)

(b) (0, 0) and (1, -4)

(c) (1, 1) and (4, -3)

(d) (2, -5) and (5, 3)

(e) (-2, 5) and (3, -5)

2 Find the gradient of the line between these points using the formula method:

(a) (1, 1) and (4, 5)

(b) (3, 6) and (2, 8)

(c) (1, 1) and (4, -2)

(d) (1, -4) and (5, 2)

(e) (-3, 2) and (4, -6)

Worksheet 9

A 4.65

- B 1 (a) 625% (b) 512.5% (c) 333.33%
 (d) 71.43% (e) 242.86% (f) 1125%
 (g) 920% (h) 511.11% (i) 622.22%
 (j) 1133.33% (k) 582.57% (l) 944.44%

- 2 (a) $2\frac{4}{5}$ (b) $5\frac{2}{5}$ (c) $\frac{67}{100}$ (d) $\frac{17}{25}$
 (e) $\frac{13}{40}$ (f) $\frac{467}{500}$ (g) $\frac{48}{125}$ (h) $\frac{37}{125}$
 (i) $\frac{81}{2000}$ (j) $1\frac{17}{20}$ (k) $\frac{101}{2000}$ (l) $\frac{33}{200}$

- C 1 (a) $333\frac{1}{3}$ mL (b) $541\frac{2}{3}$ mL (c) $666\frac{2}{3}$ mL
 (d) $770\frac{5}{6}$ mL (e) 1000 mL = 1 litre

- 2 (a) 3 mins (b) $4\frac{1}{2}$ min (c) $\frac{3}{4}$ min
 (d) $3\frac{3}{4}$ min (e) $6\frac{3}{4}$ min

- D 1 (a) $1+\sqrt{11}$, $1-\sqrt{11}$ (b) $-2+\sqrt{17}$, $-2-\sqrt{17}$
 (c) $-1+\sqrt{6}$, $-1-\sqrt{6}$ (d) $2+\sqrt{3}$, $2-\sqrt{3}$
 (e) $-3+2\sqrt{5}$, $-3-2\sqrt{5}$ (f) $3+\sqrt{29}$, $3-\sqrt{29}$

- 2 (a) $\frac{2\pm\sqrt{24}}{2} = 1\pm\sqrt{6}$ (b) $\frac{-3\pm\sqrt{37}}{2}$
 (c) $\frac{-5\pm\sqrt{53}}{2}$ (d) $\frac{3\pm\sqrt{41}}{2}$
 (e) $\frac{4\pm\sqrt{60}}{2} = 2\pm\sqrt{15}$ (f) $\frac{1\pm\sqrt{41}}{2}$

- E 1 (a) $-\frac{2}{3}$ (b) -4 (c) $-1\frac{1}{3}$ (d) $2\frac{2}{3}$
 (e) -2

- 2 (a) $1\frac{1}{3}$ (b) -2 (c) -1 (d) $1\frac{1}{2}$
 (e) $-1\frac{1}{7}$