



1. A parallelogram has base $(2x - 1)$ metres and height $(4x - 7)$ metres.

The area of the parallelogram is 1 m^2 .

(i) Show that $4x^2 - 9x + 3 = 0$. [3]

(ii) Solve the equation $4x^2 - 9x + 3 = 0$.

Show all your working and give your answers correct to 2 decimal places. [4]

(iii) Calculate the height of the parallelogram. [1]

0580/41/M/J/12 Q6(a)

2. The difference between the areas of the two rectangles is 62 cm^2 .



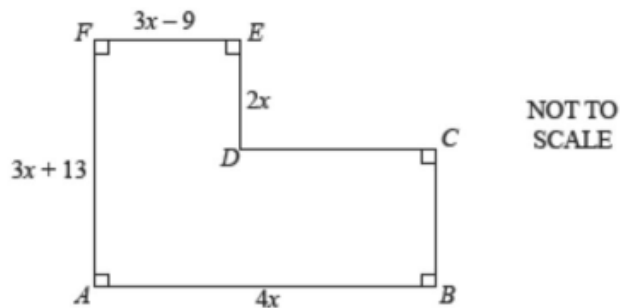
(i) Show that $x^2 + 2x - 63 = 0$. [3]

(ii) Factorise $x^2 + 2x - 63$. [2]

(iii) Solve the equation $x^2 + 2x - 63 = 0$ to find the difference between the perimeters of the two rectangles. [2]

0580/41/M/J/19 Q7(b)

3. The area of shape ABCDEF is 24 cm^2 .
All lengths are in centimetres.

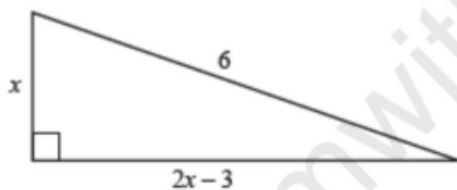


- (i) Show that $5x^2 + 17x - 12 = 0$ [3]
(ii) Solve, by factorising, the equation $5x^2 + 17x - 12 = 0$.

You must show all your working [4]

0580/42/O/N/15 Q5

4. In this question, all measurements are in metres.



The diagram shows a right-angled triangle.

- (a) Show that $5x^2 - 12x - 27 = 0$. [3]
(b) Solve $5x^2 - 12x - 27 = 0$.

Show all your working and give your answers correct to 2 decimal places. [4]

- (c) Calculate the perimeter of the triangle. [2]
(d) Calculate the smallest angle of the triangle. [2]

0580/42/M/J/18 Q7)(a)

5. (a) The perimeter of the rectangle is 80 cm.



The area of the rectangle is A cm².

(i) Show that $x^2 - 40x + A = 0$ [3]

(ii) When $A = 300$, solve, by factorising, the equation

$$x^2 - 40x + A = 0 \quad [3]$$

(iii) When $A = 200$, solve, by using the quadratic formula, the equation $x^2 - 40x + A = 0$.

Show all your working and give your answers correct to 2 decimal places. [4]

(b) A car completes a 200 km journey with an average speed of x km/h.

The car completes the return journey of 200 km with an average speed of $(x + 10)$ km/h.

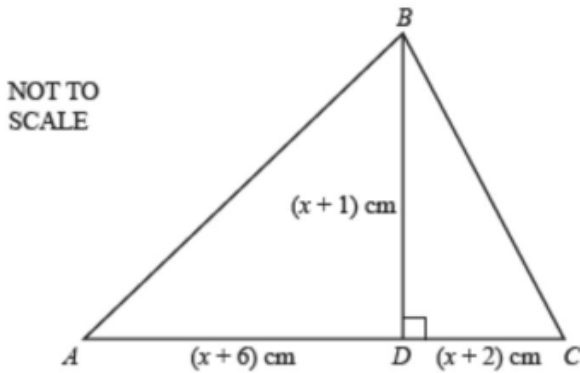
(i) Show that the difference between the time taken for each of the two journeys is $\frac{2000}{x(x+10)}$ hours. [3]

(ii) Find the difference between the time taken for each of the two journeys when $x = 80$. Give your answer in minutes and seconds.

[3]

0580/41/M/J/16 Q6

6. (a) In triangle ABC, the line BD is perpendicular to AC.



In triangle ABC, the line BD is perpendicular to AC.

$AD = (x+6)$ cm, $DC = (x+2)$ cm and the height $BD = (x+1)$ cm.

The area of triangle ABC is 40 cm^2 .

(i) Show that $x^2 + 5x - 36 = 0$. [3]

(ii) Solve the equation $x^2 + 5x - 36 = 0$. [2]

(iii) Calculate the length of BC. [2]

(b) Amira takes 9 hours 25 minutes to complete a long walk.

(i) Show that the time of 9 hours 25 minutes can be written as

$\frac{113}{12}$ hours. [1]

(ii) She walks $(3y+2)$ kilometres at 3 km/h and then a further $(y+4)$ kilometres at 2 km/h. Show that the total time taken is

$\frac{9y+16}{6}$ hours. [2]

(iii) Solve the equation $\frac{9y+16}{6} = \frac{113}{12}$ [2]

(iv) Calculate Amira's average speed, in kilometres per hour, for the whole walk. [3]

0580/04/M/J/09 Q6)

7. Carol walks 12 km at x km/h and then a further 6km at $(x-1)$ km/h.

The total time taken is 5 hours.

(i) Write an equation, in terms of x , and show that it simplifies to

$$5x^2 - 23x + 12 = 0. [3]$$

(ii) Factorise $5x^2 - 23x + 12$. [2]

(iii) Solve the equation $5x^2 - 23x + 12 = 0$ [1]

(iv) Write down Carol's walking speed during the final 6km. [1]

0580/41/O/N/19 Q7

8. Alfonso runs 10km at an average speed of x km/h.

The next day he runs 12km at an average speed of $(x - 1)$ km/h.

The time taken for the 10km run is 30 minutes less than the time taken for the 12km run.

(i) Write down an equation in x and show that it simplifies to

$$x^2 - 5x - 20 = 0. [4]$$

(ii) Use the quadratic formula to solve the equation $x^2 - 5x - 20 = 0$.

Show your working and give your answers correct to 2 decimal places.

[4]

(iii) Find the time that Alfonso takes to complete the 12km run.

Give your answer in hours and minutes correct to the nearest minute.

[2]

0580/43/M/J/16 Q7

9. Luigi and Alfredo run in a 10km race.

Luigi's average speed was x km/h.

Alfredo's average speed was 0.5km/h slower than Luigi's average speed.

(a) Luigi took $10 / x$ hours to run the race.

Write down an expression, in terms of x , for the time that Alfredo took to run the race. [1]

(b) Alfredo took 0.25 hours longer than Luigi to run the race.

(i) Show that $2x^2 - x - 40 = 0$. [4]

(ii) Use the quadratic formula to solve

$$2x^2 - x - 40 = 0$$

Show all your working and give your answers correct to 2 decimal places. [4]

(iii) Work out the time that Luigi took to run the 10km race.

Give your answer in hours and minutes, correct to the nearest minute. [3]

0580/43/O/N/17 Q9)

10. Paulo and Jim each buy sacks of rice but from different shops.

Paulo pays \$72 for sacks costing \$ m each.

Jim pays \$72 for sacks costing \$ $(m + 0.9)$ each.

(a) (i) Find an expression, in terms of m , for the number of sacks Paulo buys. [1]

(ii) Find an expression, in terms of m , for the number of sacks Jim buys. [1]

(b) Paulo buys 4 more sacks than Jim.

Write down an equation, in terms of m , and show that it simplifies to

$$10m^2 + 9m - 162 = 0. [4]$$

(c) (i) Solve $10m^2 + 9m - 162 = 0$. [3]

(ii) Find the number of sacks of rice that Paulo buys. [1]

0580/41/O/N/18 Q9)

11. Apples cost x cents each and oranges cost $(x + 2)$ cents each.

Dylan spends \$3.23 on apples and \$3.23 on oranges.

The total of the number of apples and the number of oranges

Dylan buys is 36.

(a) Write an equation in x and show that it simplifies to $18x^2 - 287x - 323 = 0$. [4]

(b) (i) Find the two prime factors of 323. [1]

(ii) Complete the statement.

$$18x^2 - 287x - 323 =$$

$$(18x \dots\dots\dots)(x \dots\dots\dots) \quad [2]$$

(iii) Solve the equation $18x^2 - 287x - 323 = 0$. [1]

(c) Find the largest number of apples Dylan can buy for \$2. [1]

0580/41/O/N/16

12. Sara spends \$ x on pens which cost \$2.50 each.

She also spends \$ $(x - 14.50)$ on pencils which cost \$0.50 each.

The total of the number of pens and the number of pencils is 19.

Write down and solve an equation in x . [6]

0580/41/O/N/13 Q8(c)

Answers

Q1) (i) $(4x - 7)(2x - 1) = 1$ (ii) 0.41, 1.84 (iii) 0.36 or 0.37	Q7) (c)(i) $12/x + 6/(x - 1) = 5$ (ii) $(5x - 3)(x - 4)$ (iii) $3/5$, 4 (iv) 3
Q2) (i) $(2x + 3)(x - 1) - (x + 1)(x - 2) = 62$ (ii) $(x + 9)(x - 7)$ (iii) 20	Q8) (a)(i) $12/(x - 1) - 10/x = 1/2$ (ii) -2.62, 7.62 (iii) 1 [hr] 49 [mins]
Q3) Q5(a)(i) $4x(3x + 13) - 2x(4x - \{3x - 9\}) = 24$ (ii) $3/5$, -4	Q9) (a) $10/(x - 0.5)$ (b)(i) $10/(x - 0.5) - 10/x = 0.25$ (ii) -4.23 and 4.73 (iii) 2 [hours] 7 [minutes]
Q4) (a) $x^2 + (2x - 3)^2 = 6^2$ (b) -1.42, 3.82 (c) 14.4 or 14.5 (d) 39.5	Q10) (a)(i) $72/m$ (ii) $72/(m + 0.9)$ (b) $72/m - 72/(m + 0.9) = 4$ (c) (i) 3.6 and -4.5 (c)(ii) 20
Q5) (a)(i) $A = 1/2(80 - 2x) \times x$ (ii) 30, 10 (iii) 5.86, 34.14 (b)(i) $200/x - 200/(x + 10)$ (ii) 16 [min] 40 [s]	Q11) (a) $323/x + 323/(x + 2) = 36$ (b)(i) 17, 19 (ii) $(\dots + 19)(\dots - 17)$ (iii) 17, -19/18 (c) 11
Q6) (a)(i) $0.5 [(x + 6) + (x + 2)] \times (x + 1) (= 40)$ (ii) -9, 4 (iii) 7.81 (b)(i) $9 + 25/60$ (ii) $\frac{2(3y+2)}{6} + \frac{3(y+4)}{6}$ (iii) 4.5 (iv) 2.55	Q12) $x/2.5 + (x - 14.5)/0.5 = 19$, $x = 20$