

# Quadratic Equations

## Question Paper 3

Level	IGCSE
Subject	Maths (0580)
Exam Board	Cambridge International Examinations (CIE)
Paper Type	Extended
Topic	Algebra and Graphs
Sub-Topic	Solving Equations – Quadratic Equations
Booklet	Question Paper 3

**Time Allowed:** 60 minutes

**Score:** /50

**Percentage:** /100

**Grade Boundaries:**

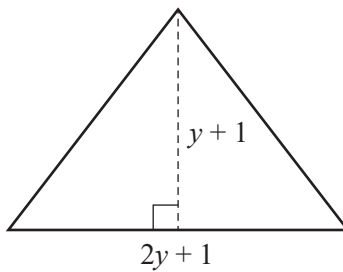
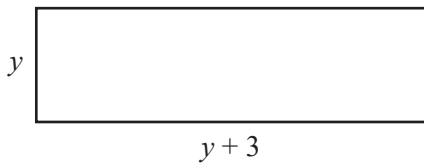
A*	A	B	C	D	E	U
>85%	75%	60%	45%	35%	25%	<25%

- 1 (a) The cost of a loaf of bread is  $x$  cents.  
The cost of a cake is  $(x - 5)$  cents.  
The total cost of 6 loaves of bread and 11 cakes is \$13.56 .

Find the value of  $x$ .

Answer(a)  $x = \dots\dots\dots$  [4]

(b)



NOT TO SCALE

The area of the rectangle and the area of the triangle are equal.

Find the value of  $y$ .

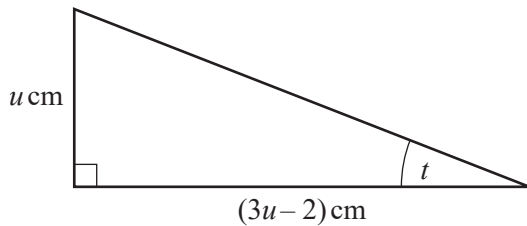
Answer(b)  $y = \dots\dots\dots$  [4]

- (c) The cost of a bottle of water is  $(w + 1)$  cents.  
 The cost of a bottle of milk is  $(2w - 11)$  cents.  
 A certain number of bottles of water costs \$4.80 .  
 The same number of bottles of milk costs \$7.80 .

Find the value of  $w$ .

Answer(c)  $w = \dots\dots\dots$  [4]

(d)



NOT TO SCALE

The area of the triangle is  $2.5 \text{ cm}^2$ .

- (i) Show that  $3u^2 - 2u - 5 = 0$ .

Answer(d)(i)

[2]

- (ii) Factorise  $3u^2 - 2u - 5$ .

Answer(d)(ii)  $\dots\dots\dots$  [2]

- (iii) Find the size of angle  $t$ .

Answer(d)(iii)  $t = \dots\dots\dots$  [3]

- 2 (a) Rearrange the formula  $v^2 = u^2 - 2as$  to make  $u$  the subject.

Answer(a)  $u = \dots\dots\dots$  [2]

- (b) Chuck cycles along Skyline Drive.  
He cycles 60 km at an average speed of  $x$  km/h.  
He then cycles a further 45 km at an average speed of  $(x + 4)$  km/h.  
His total journey time is 6 hours.

- (i) Write down an equation in  $x$  and show that it simplifies to  $2x^2 - 27x - 80 = 0$ .

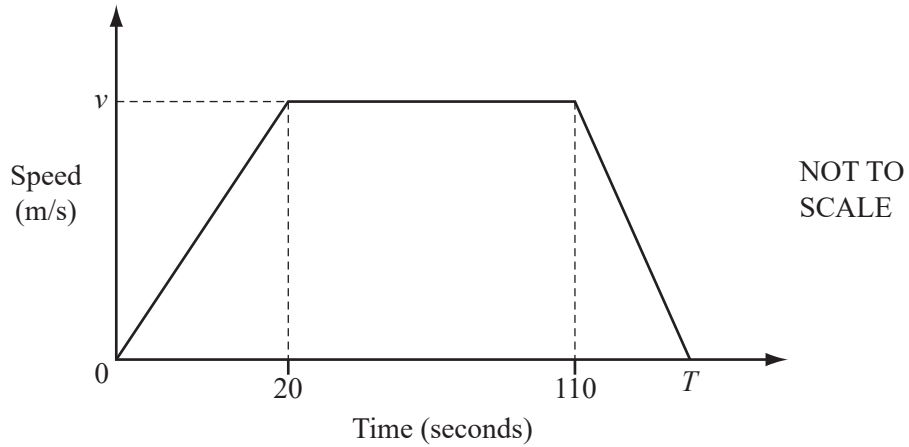
Answer(b)(i)

[4]

- (ii) Solve  $2x^2 - 27x - 80 = 0$  to find the value of  $x$ .

Answer(b)(ii)  $x = \dots\dots\dots$  [3]

(c) The diagram shows the speed-time graph for a car travelling along a road for  $T$  seconds.



To begin with the car accelerated at  $0.75 \text{ m/s}^2$  for 20 seconds to reach a speed of  $v \text{ m/s}$ .

(i) Show that the speed,  $v$ , of the car is  $15 \text{ m/s}$ .

*Answer(c)(i)*

[1]

(ii) The total distance travelled is **1.8 kilometres**.

Calculate the total time,  $T$ , of the journey.

*Answer(c)(ii)* ..... seconds [4]

(d) Asma runs 22 kilometres, correct to the nearest kilometre.  
She takes  $2\frac{1}{2}$  hours, correct to the nearest half hour.

Calculate the upper bound of Asma's speed.

*Answer(d)* ..... km/h [3]

**3 (a)** Factorise  $3x^2 + 2x - 8$ .

*Answer(a)* ..... [2]

**(b)** Solve the equation  $3x^2 + 2x - 8 = 0$ .

*Answer(b)*  $x =$  ..... or  $x =$  ..... [1]

- 4 (a) (i) Show that the equation  $\frac{7}{x+4} + \frac{2x-3}{2} = 1$  can be simplified to  $2x^2 + 3x - 6 = 0$ .

*Answer(a)(i)*

[3]

- (ii) Solve the equation  $2x^2 + 3x - 6 = 0$ .

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

*Answer(a)(ii)*  $x = \dots\dots\dots$  or  $x = \dots\dots\dots$  [4]

- (b) The **total** surface area of a cone with radius  $x$  and slant height  $3x$  is equal to the area of a circle with radius  $r$ .

Show that  $r = 2x$ .

[The curved surface area,  $A$ , of a cone with radius  $r$  and slant height  $l$  is  $A = \pi rl$ .]

*Answer(b)*

[4]

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