GCSE · Edexcel · Maths

2 hours 27 questions

Exam Questions

Forming & Solving Equations

Forming Equations from Words / Forming Equations from Shapes

Easy (5 questions)	/13
Medium (11 questions)	/48
Hard (11 questions)	/45
Total Marks	**/106**

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Easy Questions

1 (a) There are n picnic baskets. Each picnic basket contains 5 sandwiches.

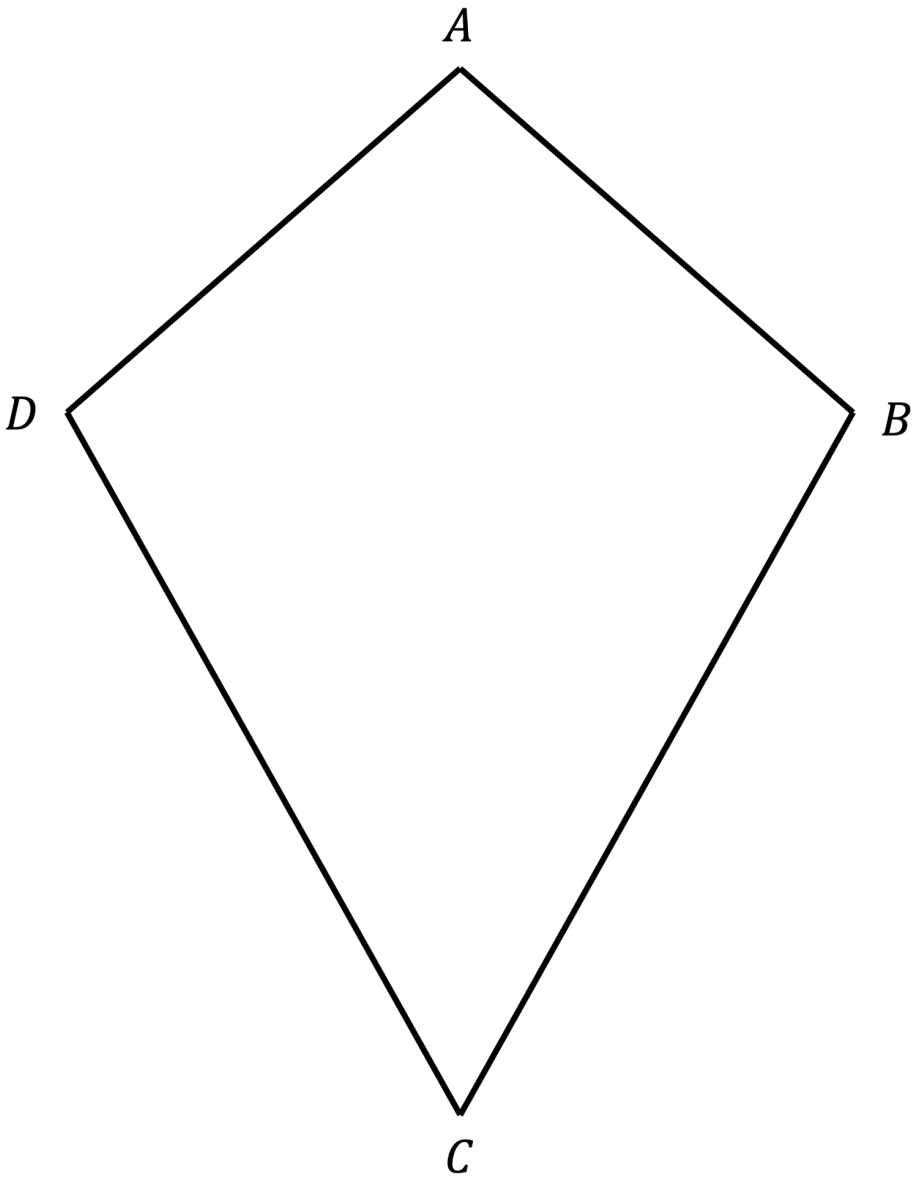
Write an expression, in terms of n, for the total number of sandwiches in the picnic baskets.

(1 mark)

(b) Given that the total number of sandwiches is 35 write down an equation that describes the situation.

(1 mark)

2 The diagram shows a diamond. The diamond has one line of symmetry.



$AD = x + 4$
$CD = 3x - 2$

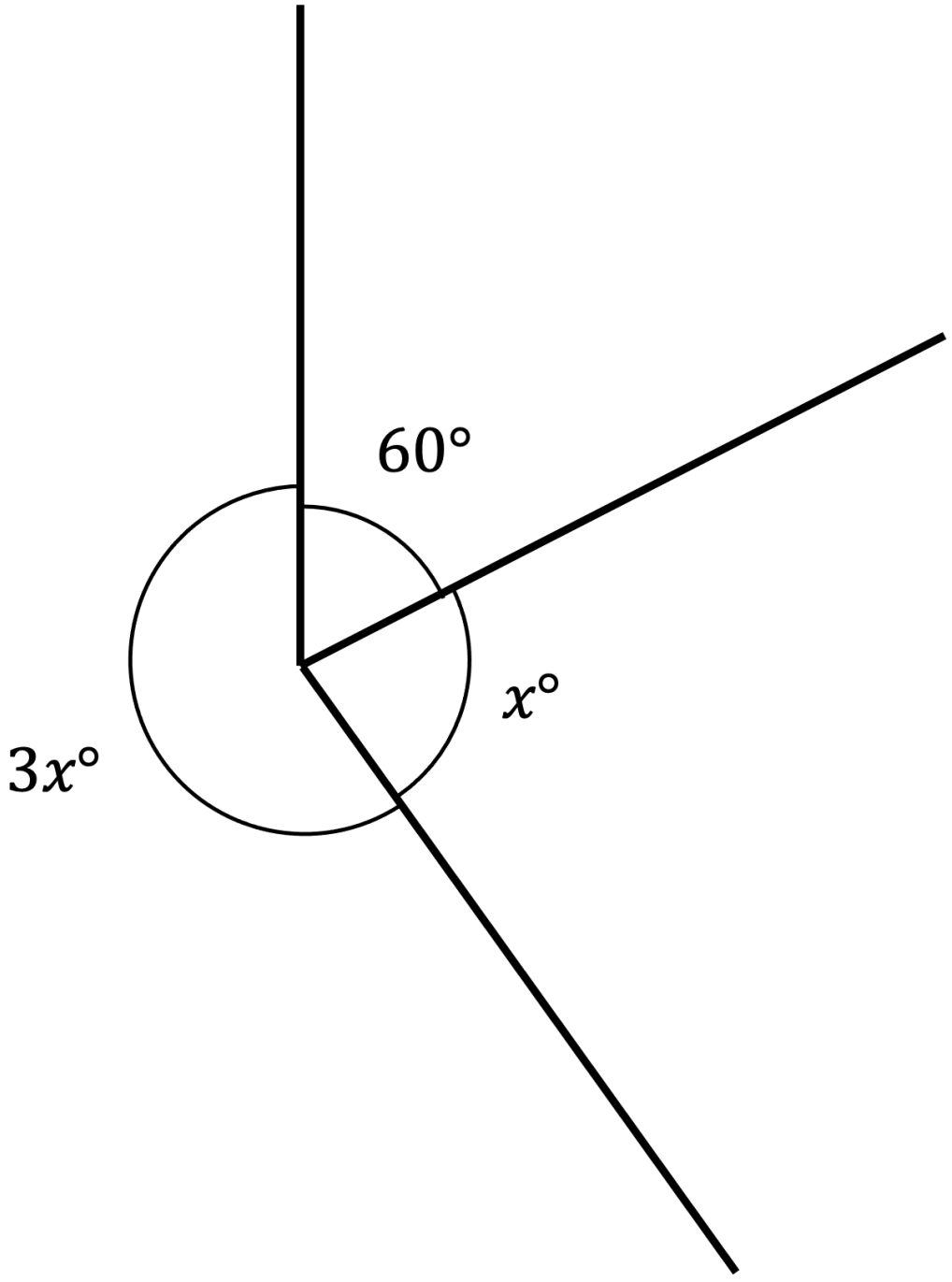
All these measurements are given in centimetres.

The perimeter of the diamond is 36 cm.

Show that $8x + 4 = 36$

(3 marks)

3



Write down an equation in terms of x for the sum of the angles around a point.

(2 marks)

4 (a) Esme buys x magazines at \$2.45 each and y cards at \$3.15 each.

Write down an expression, in terms of x and y, for the total cost, in dollars, of the magazines and the cards.

\$ .....

(2 marks)

(b) Esme spends \$60.55 in total.
She buys 8 magazines.

How many cards does she buy?

(2 marks)

5 Bag A weighs x kg.
Bag B weighs twice as much as bag A.
Bag C weighs 3 kg more than bag B.

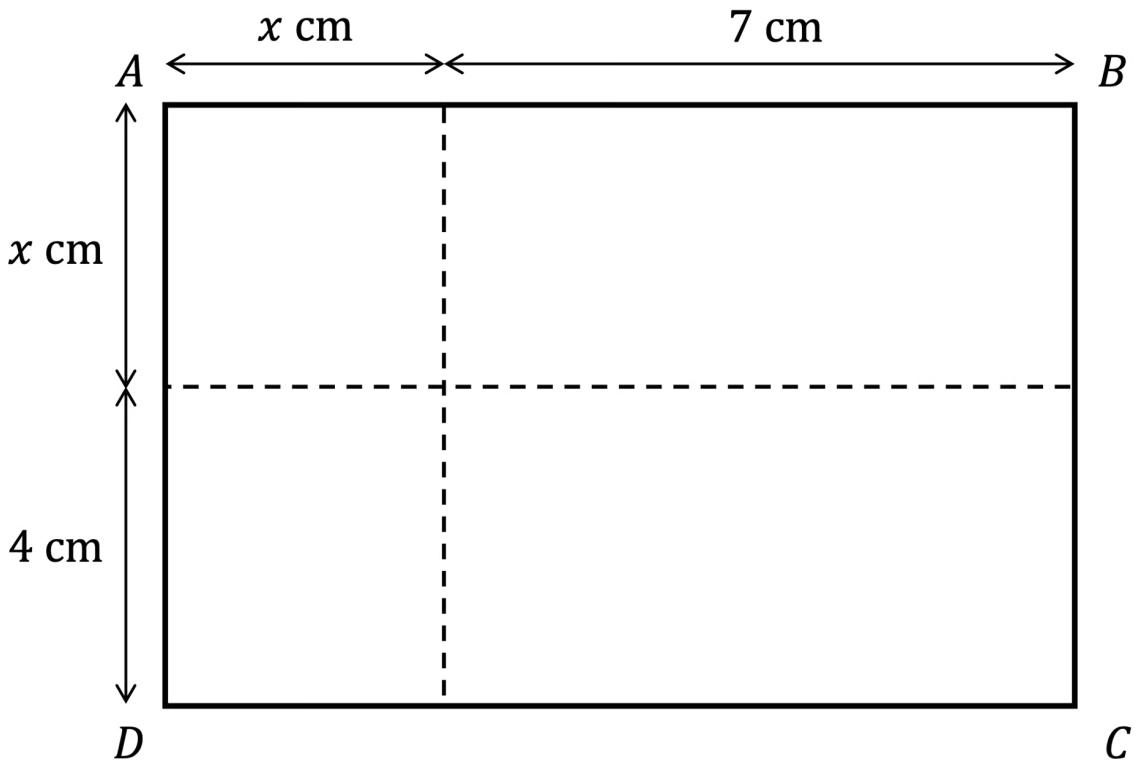
The total weight of all three bags is 28 kg.

Show that $5x + 3 = 28$

(2 marks)

Medium Questions

1



The area of square $ABCD$ is 70 cm^2.

Show that $x^2 + 11x = 42$

(3 marks)

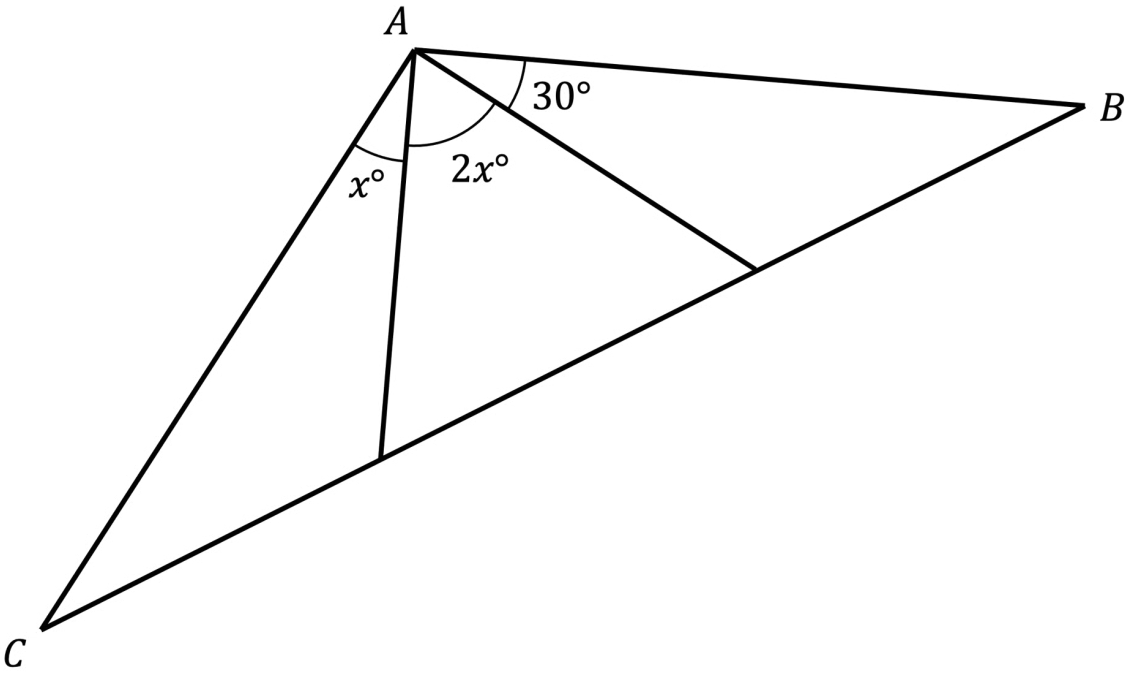
2 The size of the largest angle in a triangle is 3 times larger than the smallest angle.
The other angle is $16°$ less than the largest angle.

Work out, in degrees, the size of each angle in the triangle.
You must show your working.

.....°, ...°, ...°

(5 marks)

3 The diagram shows triangle ABC.



Angle BAC is an **obtuse** angle.

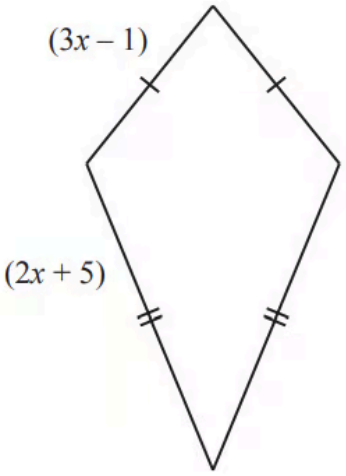
Find the minimum value of x.

You must show all your working

x is larger than .....

(3 marks)

4 In this part, all measurements are in centimetres.



NOT TO SCALE

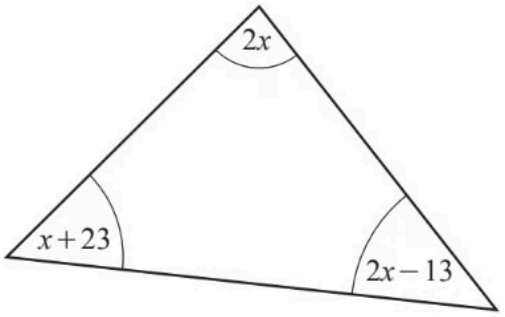
The diagram shows a kite with sides $(2x + 5)$ and $(3x - 1)$. The perimeter of the kite is 33 cm.

Work out the length of a shorter side.

..... cm

(5 marks)

5 In this part, all angles are in degrees.



NOT TO SCALE

i) Use the information in the triangle to write down an equation in terms of x.

[1]

ii) Solve this equation to find the value of x.

x = ... [3]

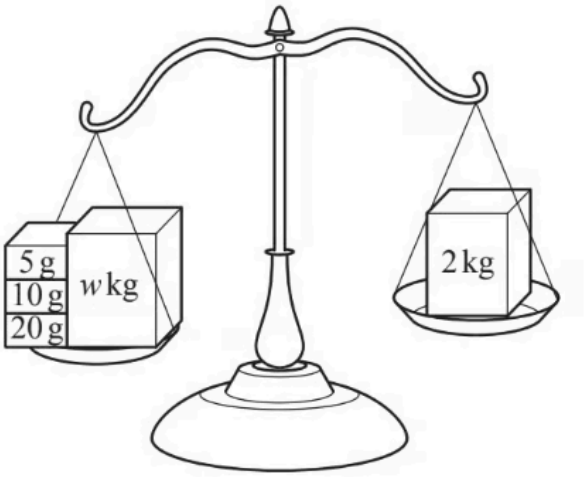
iii) Work out the size of the smallest angle in the triangle.

[2]

(6 marks)

6 i) Navja weighs a parcel with mass $w$kg on her scales. She uses the masses shown to

balance the scales.



Work out the value of w.

w = ... [3]

ii) Sometimes Navja uses an electronic weighing machine. The machine gives the mass, p kg, of a parcel as 12.4kg, correct to the nearest 100g.

Complete this statement about the value of p.

..... $\leqslant p <$ ..... [2]

(5 marks)

7 A club is arranging transport for its members.

Speedy Coaches charge \$625 plus \$15 per member.

The total cost, in dollars, for x members is given by the expression $15x + 625$.

i) Sporty Coaches charge $117 plus $19 per member.

Write an expression for the total cost, in dollars, for x members.

[2]

ii) The total cost is the same for both Speedy Coaches and Sporty Coaches.

Write down an equation and solve it to find x.

x = ... [3]

(5 marks)

8 Esme buys 8 magazines at $2.45 each and y cards at $3.15 each.

Esme spends $60.55 in total.

How many cards does she buy?

(2 marks)

9 Neelum hires a machine to clean carpets.
It costs $25 to hire the machine for the first day and $9 for each extra day after the first day.
Neelum pays a total of $88 to hire the machine.

Work out the **total** number of days she hires the machine for.

(3 marks)

10 (a) A shop sells pens and notebooks.
The cost of a pen is p cents and the cost of a notebook is n cents.

On Monday, the shop sells 5 pens and 4 notebooks for 450 cents.

Complete the equation.

$$5p + 4n = \text{.....}$$

(1 mark)

(b) On Tuesday, the shop sells 10 pens and 3 notebooks for 525 cents.

Write this information as an equation.

..... = ...

(2 marks)

(c) Solve your two equations to find the cost of a pen and the cost of a notebook.

You must show all your working.

Cost of a pen = ... cents
Cost of a notebook = ... cents

(3 marks)

11 Beindu goes to the market to buy apples and bananas.

She can buy

- 7 apples and 4 bananas for 85 cents
- or 3 apples and 8 bananas for 93 cents.

Apples cost a cents each and bananas cost b cents each.

i) This information can be used to write down two equations.
One of these is $7a + 4b = 85$.

Write down the other equation.

..... = ... [2]

ii) Solve these two simultaneous equations. You must show all your working.

a = ...
b = ... [3]

(5 marks)

Hard Questions

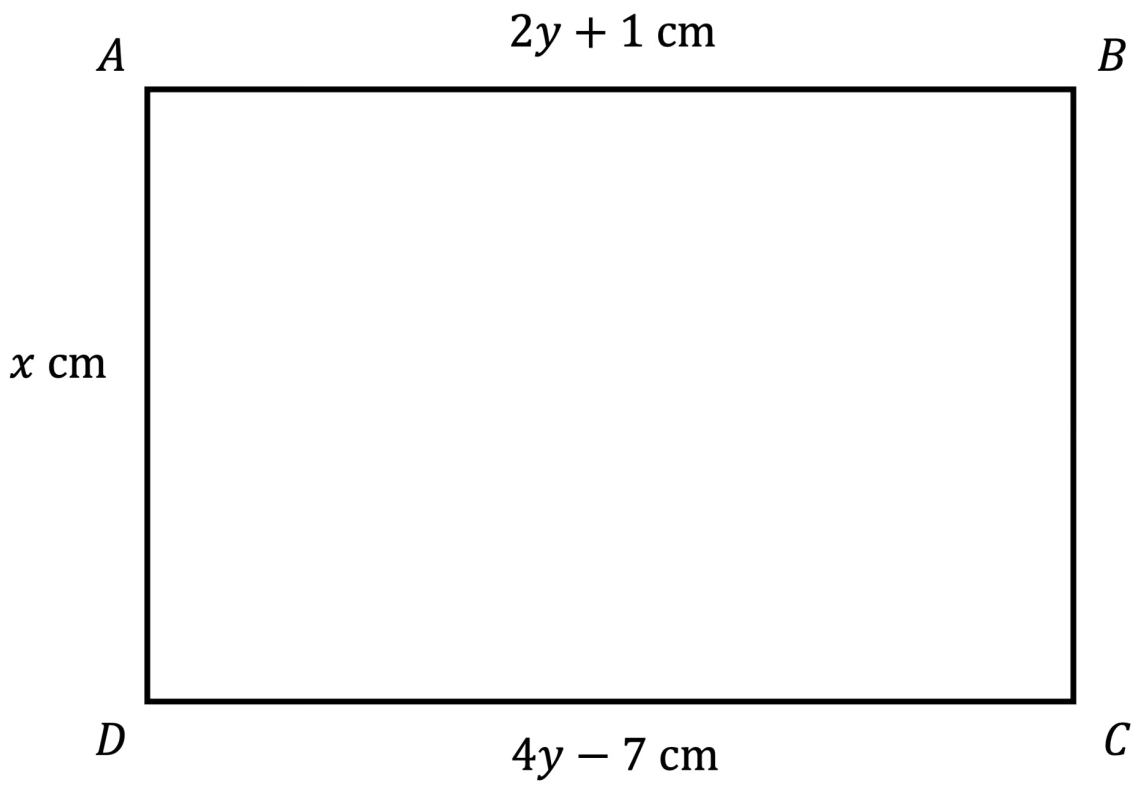
1 Sharon has double the number of sweets that Josephine has. Martin has 8 fewer sweets than Sharon.

The total number of sweets between the three of them is 27.

Find the ratio of Martin to Josephine to Sharon for the number of sweets that each of them has.

(4 marks)

2



Rectangle $ABCD$ is a rectangle.
All measurements are in centimetres.

The rectangle has an area of 54 cm^2.

Show that $x = 6$

(4 marks)

3 The first four terms of a quadratic sequence are

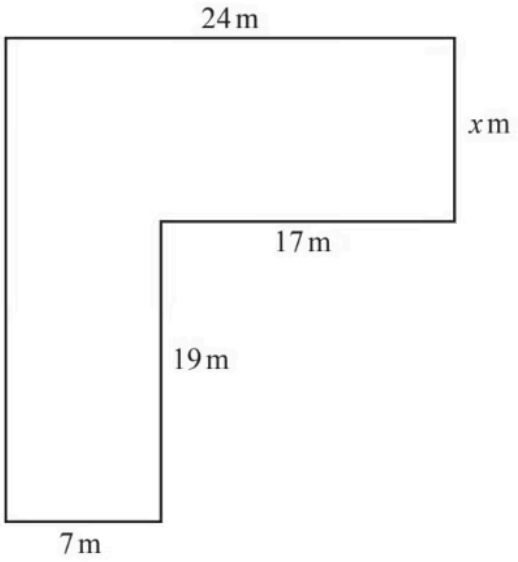
$$a \quad a+3 \quad a+8 \quad a+15$$

The sum of the first five terms of this sequence is 70.

Find the value of the sixth term.

(1 mark)

4



The diagram shows a shape made from rectangles.
The shape has a total area of 517m^2.

Find the value of x.

$x =$ .....

(4 marks)

5 Rovers, United and City are football teams.

Rovers scored x goals.
United scored 8 goals more than Rovers.
City scored 3 goals less than twice the number of goals scored by Rovers.

The three teams scored a total of 117 goals.

Write down and solve an equation to find the value of x.

x = ...

(4 marks)

6 Cara has n pencils.
Alice has twice as many pencils as Cara.
Leon has three more pencils than **Alice**.
The three children have a total of 58 pencils.

Use this information to write down an equation and solve it to find the value of n.

n = ...

(4 marks)

7 The Fraser family and the Singh family go to the cinema.
The Fraser family buys 6 adult tickets and 2 child tickets for $124. The Singh family buys 3 adult tickets and 5 child tickets for $100.

Find the price of an adult ticket and the price of a child ticket.

Adult ticket $ .....
Child ticket $ .....

(5 marks)

8 A plant costs p dollars and a bush costs b dollars.
Ana buys 2 plants and 4 bushes for $42.
Paola buys 7 plants and 9 bushes for $107.

Write down a pair of simultaneous equations and solve them to find the value of p and the value of b. You must show all your working.

p = ...
b = ...

(6 marks)

9 Alphonse is x years old and Beatrice is y years old. Three times Alphonse's age is equal to 5 times Beatrice's age. Twice Beatrice's age is 4 years more than Alphonse's age.

i) Use this information to write down two equations in x and y.

[2]

ii) Find the age of Alphonse and the age of Beatrice.

Alphonse ..... years old
Beatrice ..... years old [3]

(2 marks)

10 Des thinks of two numbers.
The sum of his two numbers is -6.
The difference between his two numbers is 62.

Find the two numbers.

..... and .....

(4 marks)

11 A cost to hire a minibus depends on the number of hours it is hired for, and the number of passengers. The cost is $h per hour plus $p per passenger.

i)When the minibus is hired for 3 hours with 10 passengers the cost is $61.

Complete the equation.

$3h + 10p =$ .....

[1]

ii) When the minibus is hired for 5 hours with 8 passengers the cost is $80.

Write this information as an equation.

[2]

iii) Solve your two simultaneous equations to find h and p.
You must show all your working.

h = ...

p = ...[4]

(7 marks)