

Section 1: Solving problems

Solutions to Exercise level 1

1. Let the number be x

Dividing the number by 3 gives $\frac{x}{3}$

Subtracting 24 by the number gives $x - 24$

These are equal so $\frac{x}{3} = x - 24$

$$x = 3(x - 24)$$

$$x = 3x - 72$$

$$2x = 72$$

$$x = 36$$

The number is 36.

(Check: $\frac{36}{3} = 12$, $36 - 24 = 12$)

2. x is the length of 3 blocks. Let y be the length of 1 block, so $x = 3y$

Each long side has length $8y$

Each short side has length y

$$\begin{aligned} \text{So perimeter} &= 8y + y + 8y + y \\ &= 18y \end{aligned}$$

$$= 6x$$

Perimeter is 54 cm so $6x = 54$

$$x = 9$$

The value of x is 9.

3. Let x be the number of cappuccinos

Cappuccinos cost 240p so cost of cappuccinos = $240x$

She bought 2 Americanos at 190p so cost of Americanos = 380

Total cost $240x + 380$

£9 change from £20 means total cost was £11 or 1100p

$$240x + 380 = 1100$$

$$240x = 720$$

$$x = 3$$

She bought 3 cappuccinos

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4. Let width of rectangle be x cm, so length is $3x$ cm.

$$\text{Perimeter} = x + 3x + x + 3x = 8x$$

$$\text{Perimeter is } 40 \text{ cm, so } 8x = 40$$

$$x = 5$$

So width is 5 cm and length is 15 cm

$$\text{Area} = 5 \times 15 = 75 \text{ cm}^2$$

5. Raj's graph is more likely to be accurate.

Anna has overlooked the fact that when she buys a pack of stickers, she may have some of them in her book already. The more spaces she fills in her book, the less likely it is that all five stickers in the pack she buys will be ones that she doesn't yet have.

6. Her average is 12 from 5 tests, so the total of her marks in those 5 tests is

$$12 \times 5 = 60.$$

Suppose she gets full marks in the final test (20 marks).

Her total will then be 80.

$$\text{Her average will then be } \frac{80}{6} = 13.3.$$

So she cannot increase her average mark to above 15 – that would require her to score more than 20 marks.