

Answer on Question #64301 – Math – Algebra

Question

1(a) A number is written as 37 in base x . Twice the number is written as 75 in base x . Find the value of x

Solution

1 (a) If x is the base, then $(3x + 7) * 2 = 7x + 5 \rightarrow x = 9$.

Answer: $x = 9$.

Question

(B) A garden, in front of a square is surrounded by a path which is 1m wide on two opposite sides and $1/2$ m wide on the two opposite sides. If the area of the path is $17m^2$, calculate the :

1. perimeter of the garden
2. area of the space covered by the garden and the path

Solution

(B) Let x be the side of the garden.

Area of the path:

$$(x + 1 + 1)(x + 0.5 + 0.5) - x^2 = 17 \rightarrow (x + 2)(x + 1) - x^2 = 17 \rightarrow \\ \rightarrow x^2 + 3x + 2 - x^2 = 17 \rightarrow 3x + 2 = 17 \rightarrow 3x = 15 \rightarrow x = 5 m.$$

1. Perimeter:

$$P = 4x = 4 \cdot 5 = 20 m.$$

2. Area of the garden:

$$S_g = x^2 = 5^2 = 25 m^2.$$

Area of the path:

$$S_p = 17 m^2.$$

Area of the space covered by the garden and the path:

$$S = S_g + S_p = 25 + 17 = 42 m^2 \text{ or}$$

$$S = (x + 2)(x + 1) = (5 + 2) \cdot (5 + 1) = 7 \cdot 6 = 42 m^2.$$

Answer: **1.** 20 m. **2.** 42 m².