Ex # 1.3

Q1: The Sum of three Consecutive integers is Forty-two, Find The Three integers

Solutions

let;

1^{st} integer $= x$

2^{nd} integer $= x + 1$

3^{rd} integer $= x + 2$

According To The given Condition

$$x + x+1 + x+2 = 42$$

$$3x + 3 = 42$$

$$3x = 42 - 3$$

$$3x = 39$$

$$x = \frac{39}{3}^{13}$$

$$\boxed{x = 13}$$

1^{st} integer $= x = 13$

2^{nd} integer $= x + 1$

$= 13 + 1$

$\boxed{= 14}$

3^{rd} integer $= x + 2$

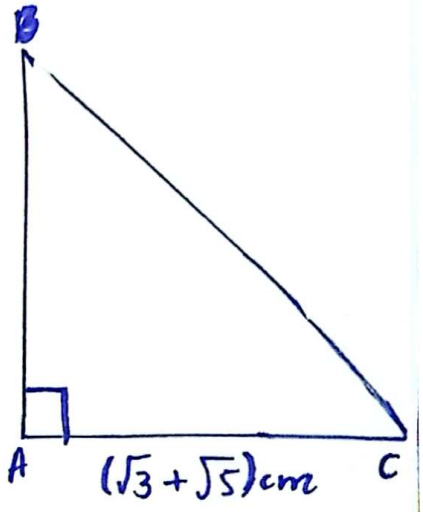
$= 13 + 2 \Rightarrow \boxed{15}$

Q2: The diagram Show and right angled ΔABC in which the length of $\overline{AC}$ is $(\sqrt{3}+\sqrt{5})$cm. The area of ΔABC is $(1+\sqrt{5})$cm^2. Find the length $\overline{AB}$ in the form $(a\sqrt{3}+b\sqrt{5})$cm, where a and b are integers.

Given:

Length of $\overline{AC} = (\sqrt{3}+\sqrt{5})_{cm}$

Area of $\Delta ABC = (1+\sqrt{15})_{cm^2}$



Find:

Length of $\overline{AB} = ?$

We Know that

Area of triangle $= \frac{1}{2}$ (Base x Height)

Area of triangle $= \frac{1}{2}(\overline{AC} \times \overline{AB})$

$$1+\sqrt{15} = \frac{1}{2}(\sqrt{3}+\sqrt{5} \times \overline{AB})$$

$$2(1+\sqrt{15}) = (\sqrt{3}+\sqrt{5}) \times \overline{AB}$$

(3)

$$\frac{2+2\sqrt{15}}{\sqrt{3}+\sqrt{5}} = \overline{AB}$$

Or

$$\overline{AB} = \frac{2+2\sqrt{15}}{\sqrt{3}+\sqrt{5}}$$

$$\overline{AB} = \frac{2+2\sqrt{15}}{\sqrt{3}+\sqrt{5}} \times \frac{\sqrt{3}-\sqrt{5}}{\sqrt{3}-\sqrt{5}}$$

$$\overline{AB} = \frac{2+2\sqrt{15} \times \sqrt{3}-\sqrt{5}}{(\sqrt{3})^2-(\sqrt{5})^2} \qquad \therefore a^2-b^2=(a+b)(a-b)$$

$$\overline{AB} = \frac{2\sqrt{3}-2\sqrt{5}+2\sqrt{15}\cdot\sqrt{3}-2\sqrt{15}\cdot\sqrt{5}}{(3-5)}$$

$$\overline{AB} = \frac{2\sqrt{3}-2\sqrt{5}+2\sqrt{45}-2\sqrt{75}}{-2}$$

3	45
3	15
5	5
	1

$$\overline{AB} = \frac{2\sqrt{3}-2\sqrt{5}+2\sqrt{3^2\times5}-2\sqrt{5^2\times3}}{-2}$$

3	75
5	25
5	5
	1

$$\overline{AB} = \frac{2\sqrt{3}-2\sqrt{5}+2\sqrt{3^2}\times\sqrt{5}-2\sqrt{5^2}\sqrt{3}}{-2}$$

(4)

$$\overline{AB} = \frac{2\sqrt{3} - 2\sqrt{5} + 6\sqrt{5} - 10\sqrt{3}}{-2}$$

$$\overline{AB} = \frac{2\sqrt{3} - 10\sqrt{3} - 2\sqrt{5} + 6\sqrt{5}}{-2}$$

$$\overline{AB} = \frac{-8\sqrt{3} + 4\sqrt{5}}{-2}$$

$$\overline{AB} = \frac{+\overset{4}{\cancel{8}}\sqrt{3}}{+\cancel{2}^{1}} + \frac{\overset{2}{\cancel{4}}\sqrt{5}}{-\cancel{2}^{1}}$$

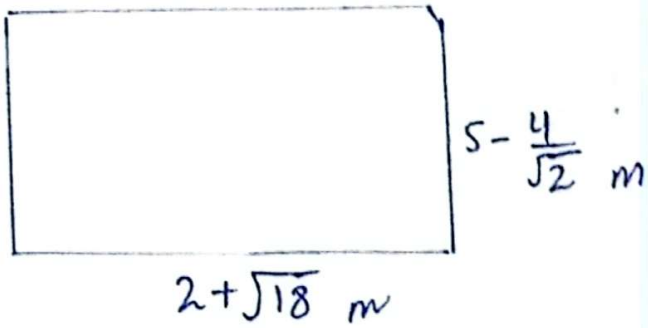
$$\boxed{\overline{AB} = 4\sqrt{3} - 2\sqrt{5} \quad \text{Ans}}$$

Q3: A rectangle has Sides of length $2+\sqrt{18}$ m and $\left(5-\frac{4}{\sqrt{2}}\right)$ m. Express the area of the rectangle in the from $a+b\sqrt{2}$, where a and b are integers.

Solution:

length $= 2+\sqrt{18}$ m

width $= \left(5-\frac{4}{\sqrt{2}}\right)$ m



Area of Rectangle = ?

We Know That

(5)

Area of Rectangle = length × width

$$= (2+\sqrt{18})\left(5-\frac{4}{\sqrt{2}}\right)$$

$$= 2\left(5-\frac{4}{\sqrt{2}}\right)+\sqrt{18}\left(5-\frac{4}{\sqrt{2}}\right)$$

$$= 10-2\times\frac{4}{\sqrt{2}}+5\sqrt{18}-\frac{4\sqrt{18}}{\sqrt{2}}$$

$$= 10-\frac{\sqrt{2}\cdot\sqrt{2}\times 4}{\sqrt{2}}+5\sqrt{3^2\times 2}-\frac{4\sqrt{3^2\times 2}}{2}$$

$$= 10-4\sqrt{2}+5\times 3\sqrt{2}-\frac{4\times 3\sqrt{2}}{\sqrt{2}}$$

$$= 10-4\sqrt{2}+15\sqrt{2}-12$$

$$= 10-12-4\sqrt{2}+15\sqrt{2}$$

$$= -2+11\sqrt{2}$$

Area of Rectangle $= (-2+11\sqrt{2})\ m^2$ Ans.

Q4: Find two numbers whose Sum is 68 and difference is 22. (6)

let:

Two numbers are a and b

According to given Condition

$$a + b = 68 \longrightarrow (i)$$
$$a - b = 22 \longrightarrow (ii)$$

Add (i) and (ii)

$$2a = 90$$

$$a = \frac{90^{45}}{2^{1}}$$

$$\boxed{a = 45}$$

Put $a = 45$ in eq (i)

$$a + b = 68$$
$$45 + b = 68$$
$$b = 68 - 45$$
$$\boxed{b = 23}$$

Qs: The weather in lahore was unusually warm during the Summer of 2024. The TV news reported temperature as high as 48°C. By using the formula, $(°F = \frac{9}{5}°C + 32)$ Find the temperature as Fahrenheit Scale.

Solution:

Temperature in °C = 48°C

$$°F = \frac{9}{5}°C + 32$$

$$°F = \frac{9}{5}(48°) + 32$$

$$°F = \frac{432}{5} + 32$$

$$°F = 86.4 + 32$$

$$\boxed{°F = 118.4}$$ Ans

Q6: The Sum of the ages of the Father and Son is 72 years. Six years ago? the Father's age was 2 times the age of the Son. what was Son's ago Six years ago?

let:

Son's age $= x$

Father's age $= y$

According to the Condition of question

$$x + y = 72 \quad \text{——(i)}$$

Six years ago

Son's age $= x - 6$

Father's age $= y - 6$

According To Condition.

$$y - 6 = 2(x - 6)$$

$$y - 6 = 2x - 12$$

$$-6 + 12 = 2x - y$$

$$6 = 2x - y$$

Or

$$2x - y = 6 \quad \text{——— (ii)}$$

Adding (i) and (ii)

$$\begin{array}{rl} x + y &= 72 \\ 2x - y &= 6 \\ \hline 3x &= 78 \end{array}$$

$$x = \frac{78}{3}$$

$$x = 26$$

Six years ago

Son's age $= x - 6$

$= 26 - 6$

Son's age = 20 years Ans

Q7: Mirha bought a toy for Rs. 1500 and Sold for Rs. 1520. What was her profit Percentage?

Solution:

Cost Price = 1500

Selling Price = 1520

$$\text{Profit} = \text{Selling Price} - \text{Cost Price}$$

$$= 1520 - 1500$$

$$= \text{Rs. } 20$$

$$\text{Profit \%} = \left(\frac{\text{Profit}}{\text{cp}} \times 100\right)\%$$

$$= \left(\frac{20}{1500} \times 100\right)\%$$

$$\boxed{\text{Profit \%} = 1.33\%}$$ Ans

Q8: The annual income of Tayyab is Rs. 9,60,000, while The exempted amount is Rs 1,30,000 How much tax would he have To Pay at the rate of 0.75% ?

Solution:

Annual income = Rs. 9,.60,000

Exempted amount = Rs. 1,30,000

Remaining amount = 9,60,000 − 1,30,000

= 8,30,000

Taxable Amount = 8,30,000 × 0.75%

$= 8,30,000 \times 0.75 \times \frac{1}{100}$

= 8300 × 0.75

Taxable amount = Rs. 6225 Ans

Q9: Find the Compound markup on Rs. 3,75,000 for one year at the rate of 14% Compounded annually?

Solution:

Principal amount (P) = Rs. 3,75,000

Time (T) = 1 year

Rate (R) = 14 %.

Compount Markup = ?

We Know That

$$\text{Markup} = P \times R \times T$$

$$= 3,75,000 \times 14\% \times 1$$

$$= 3,75,0\cancel{00} \times \frac{14}{\cancel{100}} \times 1$$

$$= 3750 \times 14$$

Markup = Rs. 52,500