

11/09/2020

classmate

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Ch-4
Exercise 4.13

Q.1 Let the length of cloth be x .
Total cost = ₹ 35
Cost of 1m cloth = $\frac{35}{x}$

ATQ,

$$(x+4) \left(\frac{35}{x} - 1 \right) = 35$$

$$35 - x + \frac{140}{x} - 4 = 35$$

$$-x + \frac{140}{x} + 31 - 35 = 0$$

$$-x^2 + 140 - 4x = 0$$

$$x^2 + 4x - 140 = 0$$

$$x^2 + 14x - 10x - 140 = 0$$

$$x(x+14) - 10(x+14) = 0$$

$$(x+14)(x-10) = 0$$

$$x+14=0$$

$$x = -14$$

(Neglected)

$$x-10=0$$

$$x = 10$$

∴ Length of cloth = 10m

Q.2 Let the total students be x .
Students who attended the picnic = $x-8$
Total budget = ₹ 480

ATQ,

$$\frac{480}{x-8} - \frac{480}{x} = 10$$

$$\frac{480x - 480 + 3840}{x^2 - 8x} = 10$$

$$x^2 - 8x$$

$$3840 = 10x^2 - 80x$$

$$10x^2 - 80x - 3840 = 0$$

$$x^2 - 8x - 384 = 0$$

$$x^2 + 16x - 24x - 384 = 0$$

$$x(x+16) - 24(x+16) = 0$$

$$(x+16)(x-24) = 0$$

$$x + 16 = 0$$

$$x = -16$$

$$x - 24 = 0$$

$$x = 24$$

$$\therefore \text{Total students} = 24$$

$$\text{Students who attended the picnic} = 24 - 8 = 16$$

Q.3 Let the CP be x

$$SP = ₹24$$

$$\text{Gain \%} = x\%$$

ATQ,

$$\text{Gain \%} = \frac{SP - CP}{CP} \times 100$$

$$x = \frac{24 - x}{x} \times 100$$

$$x^2 = 2400 - 100x$$

$$x^2 + 100x - 2400 = 0$$

$$x^2 + 120x - 200x - 2400 = 0$$

$$x(x+120) - 100(x+120) = 0$$

$$(x+120)(x-20) = 0$$

$$x+120 = 0$$

$$x = -120$$

(Neglected)

$$x-20 = 0$$

$$x = 20$$

$$\therefore CP = \boxed{\text{₹ } 20}$$

Q.5 Let the price of toy be x .

Total amount = ₹ 360

Reduced price of each toy = $x-2$

ATQ,

$$\frac{360}{x-2} - \frac{360}{x} = 2$$

$$\frac{360x - 360x + 720}{x^2 - 2x} = 2$$

$$720 = 2x^2 - 4x$$

$$2x^2 - 4x - 720 = 0$$

$$x^2 - 2x - 360 = 0$$

$$x^2 - 20x + 18x - 360 = 0$$

$$x(x-20) + 18(x-20) = 0$$

$$(x-20)(x+18) = 0$$

$$x-20 = 0$$

$$x = 20$$

$$x+18 = 0$$

$$x = -18$$

(Neglected)

$$\therefore \text{Price of each toy} = \boxed{\text{₹ } 20}$$

7 Let the total students be x .

Total budget = ₹ 500

Students who attended the picnic = $x - 5$

ATQ,

$$\frac{500}{x-5} - \frac{500}{x} = 5$$

$$\frac{500x - 500x + 2500}{x^2 - 5x} = 5$$

$$2500 = 5x^2 - 25x$$

$$5x^2 - 25x - 2500 = 0$$

$$x^2 - 5x - 500 = 0$$

$$x(x-25) + 20(x-25) = 0$$

$$(x-25)(x+20) = 0$$

$$x - 25 = 0$$

$$\boxed{x = 25}$$

$$x + 20 = 0$$

$$\boxed{x = -20}$$

(Neglected)

∴ Total students = $\boxed{25}$

Students who attended the picnic = $25 - 5$

$$= \boxed{20}$$

12/09/2020

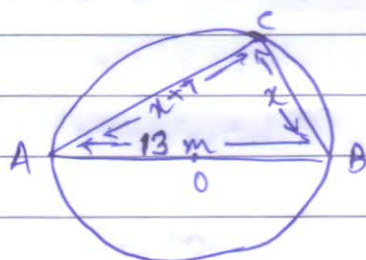
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Exercise 4.13

Q. 8



Let C be the pole on the circle.

Diameter $AB = 13 \text{ m}$

Let CB be x

Then, $AC = x + 7$

In right $\triangle ACB$,

$AB^2 = AC^2 + CB^2$ (Pythagoras theorem)

$$(13)^2 = (x)^2 + (x+7)^2$$

$$169 = x^2 + x^2 + 14x + 49$$

$$2x^2 + 14x + 49 - 169 = 0$$

$$2x^2 + 14x - 120 = 0$$

$$x^2 + 7x - 60 = 0$$

$$x^2 + 12x - 5x - 60 = 0$$

$$x(x+12) - 5(x+12) = 0$$

$$(x+12)(x-5) = 0$$

$$x+12=0$$

$$x = -12$$

(Neglected)

$$x-5=0$$

$$x = 5$$

$\therefore C$ is at a distance of 5 m from B and 12 m from A.

9. Let marks in Maths be x .
Marks in Science = $28 - x$

ATQ,

$$(x+3)(28-x-4) = 180$$

$$(x+3)(24-x) = 180$$

$$24x - x^2 + 72 - 3x = 180$$

$$-x^2 + 21x + 72 - 180 = 0$$

$$x^2 - 21x + 108 = 0$$

$$x^2 - 9x - 12x + 108 = 0$$

$$x(x-9) - 12(x-9) = 0$$

$$(x-9)(x-12) = 0$$

$$x-9=0$$

$$\boxed{x=9}$$

$$x-12=0$$

$$\boxed{x=12}$$

CASE I -

If marks in Maths is 9, then marks in Science is 19.

CASE II -

If marks in Maths is 12, then marks in Science is 16.

12. Let the time be t .

Time needed for the minute = $(60-t)$

hand to show at 6 pm

ATQ,

$$60-t = \frac{t^2}{4} - 3$$

$$60-t = \frac{t^2}{4} - 12$$

$$4(60-t) = t^2 - 12$$

$$240 - 4t = t^2 - 12$$

$$t^2 + 4t - 12 - 240 = 0$$

$$t^2 + 4t - 252 = 0$$

$$t^2 + 18t - 14t - 252 = 0 \quad (t+18)$$

$$t(t+18) - 14(t+18) = 0 \quad (t+18)$$

$$(t+18)(t-14) = 0$$

$$t + 18 = 0$$

$$t = -18$$

(Neglected)

$$t - 14 = 0$$

$$t = 14$$

∴ Hence, the value of t is 14 mins.