MODERN LANGUAGE SCHOOL & COLLEGE

01-7-20 Mathematics Class 10th

Ex : 2.8

1). let first number = x

Second number = $x+1$

Given condition is

$$x(x+1) = 182$$
$$x^2 + x = 182$$
$$x^2 + x - 182 = 0$$
$$x^2 + 14x - 13x - 182 = 0$$
$$x(x+14) - 13(x+14) = 0$$
$$(x+14)(x-13) = 0$$

$x + 14 = 0$; $x - 13 = 0$

$x = -14$; $x = 13$

Ignoring -ive value.

First number = $x = 13$

Second number = $x+1 = 13+1 = 14$

2)

First number = x

2nd number = $x+1$

3rd number = $x+2$

Given condition

$$x^2 + (x+1)^2 + (x+2)^2 = 77$$
$$x^2 + x^2 + 2x + 1 + x^2 + 4x + 4 = 77$$
$$3x^2 + 6x + 5 - 77 = 0$$
$$3x^2 + 6x - 72 = 0$$
$$3(x^2 + 2x - 24) = 0$$
$$x^2 + 2x - 24 = 0$$

Now solve above quadratic equation.

Ex. 2.8

3). Let the number = x

5 times of number = $5x$

$$x^2 + 5x = 204$$
$$x^2 + 5x - 204 = 0$$

Solve the above equ. by your self.

4). Number = x

Given condition is

$$(3x-5)(4x-1) = 7$$
$$12x^2 - 3x - 20x + 5 = 7$$
$$12x^2 - 23x + 5 = 7$$
$$12x^2 - 23x + 5 - 7 = 0$$
$$12x^2 - 23x - 2 = 0$$
$$12x^2 - 24x + x - 2 = 0$$
$$12x(x-2) + 1(x-2) = 0$$
$$(x-2)(12x+1) = 0$$

$x - 2 = 0$; $12x + 1 = 0$

$x = 2$; $12x = -1$

$x = \frac{-1}{12}$

5). Number = x

$$x - \frac{1}{x} = \frac{15}{4}$$
$$\frac{x^2 - 1}{x} = \frac{15}{4}$$
$$4x^2 - 4 = 15x$$
$$4x^2 - 15x - 4 = 0$$

Solve by your self.

Ex: 2.8

Pg#3

Number = $x + 10y$

6. $x^2 + y^2 = 65$ —(i)

$x + 10y = 9(x + y)$

$x + 10y = 9x + 9y$

$x - 9x + 10y - 9y = 0$

$-8x + y = 0$

$y = 8x$ —(ii)

From equ. (ii) put $y = 8x$ in equ (i)

$x^2 + (8x)^2 = 65$

$x^2 + 64x^2 = 65$

$65x^2 = 65$

$x^2 = 1$

$x = 1$

7). $P(x, y)$

$x + y = 9$ —(i)

$x^2 + y^2 = 45$ —(ii)

From equ (i)

$x = 9 - y$ Put this in equ (ii)

$(9-y)^2 + y^2 = 45$

$81 + y^2 - 18y + y^2 = 45$

$2y^2 - 18y + 81 - 45 = 0$

$2y^2 - 18y + 36 = 0$

$2y^2 - 12y - 6y + 36 = 0$

$2y(y-6) - 6(y-6) = 0$

$(y-6)(2y-6) = 0$

$y - 6 = 0$; $2y - 6 = 0$

$y = 6$; $y = 3$

Pg #4

Ex: 2.8

when $y = 6$

$x = 9 - y$

$x = 9 - 6$

$x = 3$

$P(3, 6)$

when $y = 3$

$x = 9 - y$

$x = 9 - 3$

$x = 6$

$P(6, 3)$

8. 1st integer $= x$

2nd integer $= y$

$x + y = 9$ ——i)

$x^2 - y^2 = 9$ ——ii)

Now solve by your self.

10. Length $= x$

width $= y$

$2x + 2y = 80\text{cm}$ ——i) $\Rightarrow$ $2(x+y) = 8\text{cm} \Rightarrow x + y = 40\text{cm}$

$xy = 375\ \text{cm}^2$ ——ii)

From equ i)

$x = 40 - y$ Put in equ ii)

$(40 - y)\, y = 375\ \text{cm}^2$

$40y - y^2 = 375\ \text{cm}^2$

$y^2 - 40y = -375$

$y^2 - 40y + 375 = 0$

H.W: Complete Q2, Q3, Q5, Q8, Q10 + Q9