3^{rd} exercise:

part-A:

1) $BC = 3\sqrt{3}(\sqrt{5}-\sqrt{3}) + \sqrt{(\sqrt{15}-9)^2}$

$= 3\sqrt{15} - 3\sqrt{3}^2 + [-(\sqrt{15}-9)]$

$= 3\sqrt{15} - 9 - \sqrt{15} + 9$

$= 2\sqrt{15}$.

sign of $\sqrt{15}-9$.

$\sqrt{15} \text{ \& } 9 = \sqrt{81}$

but $15 < 81$

then $\sqrt{15} < \sqrt{81}$

hence, $\sqrt{15} - 9 < 0$.

2) $AC\sqrt{7} = \sqrt{\sqrt{50}-1} \times \sqrt{\sqrt{50}+1} \times \sqrt{49}$.

$= \sqrt{(\sqrt{50}-1)(\sqrt{50}+1)} \times \sqrt{7^2}$.

$= \sqrt{(50-1)} \times 7$

$= (7)^2$

Thus, $AC\sqrt{7}$ is a square of the prime no. 7.

3) $AB = \sqrt{11}$.

In ΔABC we have

$AB = \sqrt{11}$; $AC = \sqrt{49}$; $BC = 2\sqrt{15} = \sqrt{60}$

So,

Apply converse of pythagorean theorem

$hyp^2 \overset{?}{=} leg_1^2 + leg_2^2$

$BC^2 \overset{?}{=} AC^2 + AB^2$

$\sqrt{60}^2 \overset{?}{=} \sqrt{49}^2 + \sqrt{11}^2$

$60 = 60$

Thus, ΔABC is right of hypotenuse BC.

part-B:

1) $X = 5 + \sqrt{48} + \frac{3}{2}\sqrt{24} - 3\sqrt{6}$

$= 5 + \sqrt{4^2 \times 3} + \frac{3}{2}\sqrt{2^2 \times 6} - 3\sqrt{6}$

$= 5 + 4\sqrt{3} + 3\sqrt{6} - 3\sqrt{6}$

$= 5 + 4\sqrt{3}$.

$y = \dfrac{3\sqrt{3} \times \sqrt{9}}{\left(\sqrt{\frac{1}{\sqrt{3}}}\right)^2} = \dfrac{9\sqrt{3}}{\frac{1}{\sqrt{3}}} = 9\sqrt{3}^2$

$= 9 \times 3$

$= 27$.

Thus, $y = (3)^3$.
which is cube of 3.