Exercise 7A

Question 20:

Perimeter of quad. ABCD = 34 + 29 + 21 + 42 = 126 cm

Area of triangle BCD = $\frac{1}{2} \times 20 \times 21 = 210 \text{ cm}^2$

For area of triangle ABD,
Let a = 42 cm, b = 20 cm and c = 34 cm

Therefore, $s = \frac{42+20+34}{2} = \frac{96}{2} = 48$ cm

Area of ABD $= \sqrt{s(s-a)(s-b)(s-c)}$

$= \sqrt{48(48-42)(48-20)(48-34)}$

$= \sqrt{48 \times 6 \times 28 \times 14}$

$= \sqrt{16 \times 3 \times 3 \times 2 \times 2 \times 14 \times 14}$

$= 4 \times 3 \times 2 \times 14 = 336 \text{ cm}^2$

Area of quad. ABCD = Area ΔABD + Area ΔBCD

Thus the area of quad. ABCD = 336 + 210 = 546 cm^2.

Question 21:
Consider the right triangle ABD.
By Pythagoras Theorem, we have

$AB = \sqrt{BD^2 - AD^2}$

$\therefore AB = \sqrt{26^2 - 24^2}$

$= \sqrt{676 - 576}$

$= \sqrt{100}$

$AB = 10$ cm

$\Rightarrow$ base $= 10$ cm

Area of the triangle ABD $= \frac{1}{2} \times \text{base} \times \text{height}$

$\Rightarrow$ Area of $\Delta ABD = \frac{1}{2} \times 10 \times 24$ [$\because$ base $= 10$ cm, height $= 24$ cm]

$\Rightarrow$ Area of $\Delta ABD = 120 \text{ cm}^2$

Area of equilateral triangle BCD $= \frac{\sqrt{3}}{4} a^2$

$\Rightarrow = \frac{1.73}{4} (26)^2$ [$a = 26$ cm, $\sqrt{3} = 1.73$]

$\Rightarrow = 292.37 \text{ cm}^2$

Area of quad. ABCD = Area of ΔABD + Area of ΔBCD

$= 120 + 292.37$

$= 412.37 \text{ cm}^2$.

********** END **********