Exercise 7A

Question 20:

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

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

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

$$\text{Area of ABD} = \sqrt{s(s-a)(s-b)(s-c)}$$
$$= \sqrt{48(48-42)(48-20)(48-34)}$$
$$= \sqrt{48 \times 6 \times 28 \times 14}$$
$$= \sqrt{16 \times 3 \times 3 \times 2 \times 2 \times 14 \times 14}$$
$$= 4 \times 3 \times 2 \times 14 = 336\ cm^2$$

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

$$AB = \sqrt{BD^2 - AD^2}$$
$$\therefore AB = \sqrt{26^2 - 24^2}$$
$$= \sqrt{676 - 576}$$
$$= \sqrt{100}$$
$$AB = 10\ cm$$
$$\Rightarrow \text{base} = 10\,cm$$

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

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

$\Rightarrow$ Area of ΔABD $= 120\,cm^2$

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

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

$\Rightarrow$ $= 292.37\,cm^2$

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

= 120 + 292.37

= 412.37 cm^2.

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