

Leçon 4

Théorème de Pythagore

EXERCICES

1- $XYZL$ est un quadrilatère tel que

$m(\angle XLZ) = m(\angle XYZ) = 90^\circ$, $XY = 7 \text{ cm}$,

$YZ = 24 \text{ cm}$, $XL = 15 \text{ cm}$

Calcule la longueur de \overline{XZ} et \overline{ZL}

$\triangle XYZ$

$$\therefore XZ^2 = XY^2 + YZ^2$$

$$\therefore XZ^2 = 7^2 + 24^2$$

$$\therefore XZ^2 = 49 + 576$$

$$\therefore XZ^2 = 625$$

$$\therefore XZ = \sqrt{625} = 25 \text{ cm}$$

$\triangle XZL$

$$\therefore XZ^2 = XL^2 + LZ^2$$

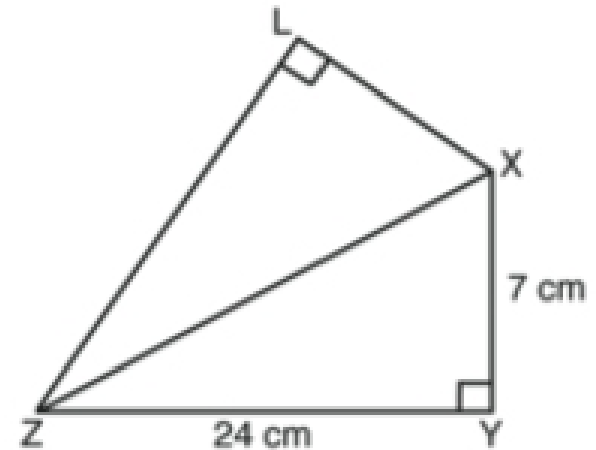
$$\therefore XL^2 = XZ^2 - LZ^2$$

$$\therefore XL^2 = 25^2 - 15^2$$

$$\therefore XL^2 = 625 - 225$$

$$\therefore XL^2 = 400$$

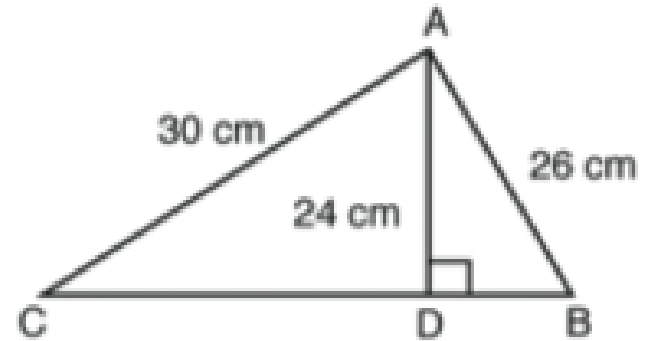
$$\therefore XL = \sqrt{400} = 20 \text{ cm}$$



2- ABC est un triangle tel que $\overline{AD} \perp \overline{BC}$.

Si $AD = 24 \text{ cm}$, $AB = 26 \text{ cm}$ et $AC = 30 \text{ cm}$

Trouve l'aire du triangle ABC.



Δ ACD

$$\therefore AC^2 = AD^2 + CD^2$$

$$\therefore CD^2 = AC^2 - AD^2$$

$$\therefore CD^2 = 30^2 - 24^2$$

$$\therefore CD^2 = 900 - 576$$

$$\therefore CD^2 = 324$$

$$\therefore CD = \sqrt{324} = 18 \text{ cm}$$

Δ ABD

$$\therefore AB^2 = AD^2 + BD^2$$

$$\therefore BD^2 = AB^2 - AD^2$$

$$\therefore BD^2 = 26^2 - 24^2$$

$$\therefore BD^2 = 676 - 576$$

$$\therefore BD^2 = 100$$

$$\therefore BD = \sqrt{100} = 10 \text{ cm}$$

$$\therefore BC = 18 + 10 = 28 \text{ cm}$$

Aire du Δ ABC = $\frac{1}{2} \times$ Base \times hauteur correspondante

$$\text{Aire du } \Delta \text{ ABC} = \frac{1}{2} \times BC \times AD = \frac{1}{2} \times 28 \times 24 = 336 \text{ cm}^2$$

3- ABCD est un trapèze tel que $\overline{AD} \parallel \overline{BC}$,
 $m(\angle DCB) = 90^\circ$, Si $AB = BC = 17$ cm et $AD = 9$ cm
 Calcule la longueur de \overline{DC} et l'aire du trapèze ABCD

$\therefore AD = 9$ cm
 $\therefore CE = 9$ cm
 $\therefore BE = 17 - 9 = 8$ cm

ΔABE

$\therefore AB^2 = AE^2 + BE^2$
 $\therefore AE^2 = AB^2 - BE^2$
 $\therefore AE^2 = 17^2 - 8^2$
 $\therefore AE^2 = 289 - 64$
 $\therefore AE^2 = 225$ $\therefore AE = \sqrt{225} = 15$ cm

$\therefore CD = AE = 15$ cm

Aire du trapèze ABCD = Aire ΔABE + Aire ABCD

Aire du trapèze ABCD = $(\frac{1}{2} \times \text{Base} \times \text{hauteur correspondante}) + (L \times l)$

Aire du trapèze ABCD = $(\frac{1}{2} \times AE \times BE) + (AE \times AD) = (\frac{1}{2} \times 15 \times 8) + (15 \times 9)$

Aire du trapèze ABCD = $60 + 135 = 195$ cm²

