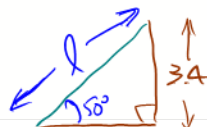


MCR3U - Chapter 5: Trigonometric Ratios - Practice

1. A ladder is leaning against a 3.4 m tall building at an angle of elevation of  $50^\circ$ . Determine the length of the ladder to the nearest tenth of a metre.

- a. 3.9 m  
 b. 3.0 m  
 c. 4.4 m  
 d. 5.3 m



$$\sin(50) = \frac{3.4}{l}$$

$$\Rightarrow l = \frac{3.4}{\sin(50)} = 4.4 \text{ m}$$

2. Determine the value of  $\theta$  to the nearest degree if  $\cot \theta = 0.75$ .

- a.  $53^\circ$   
 b.  $37^\circ$   
 c.  $45^\circ$   
 d.  $42^\circ$

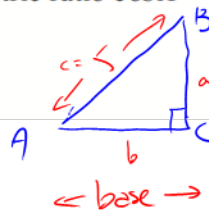
$$\cot(\theta) = 0.75$$

$$\Rightarrow \tan(\theta) = \frac{1}{0.75} = 1.3$$

$$\Rightarrow \theta = \tan^{-1}(1.3) = 53^\circ$$

3. The hypotenuse,  $c$ , of right  $\triangle ABC$  is 5.0 cm long. Given the trigonometric ratio  $\cos A = 0.75$  for angle  $A$ , what is the area of the triangle to the nearest tenth of a  $\text{cm}^2$ ?

- a. 5.4  $\text{cm}^2$   
 b. 6.2  $\text{cm}^2$   
 c. 7.3  $\text{cm}^2$   
 d. 8.0  $\text{cm}^2$



$$\cos A = \frac{b}{c}$$

$$\Rightarrow 0.75 = \frac{b}{5}$$

$$\text{base: } b = (5)(0.75) = 3.75$$

$$\text{height: } a^2 = c^2 - b^2$$

$$\Rightarrow a = \sqrt{5^2 - 3.75^2} = 3.3$$

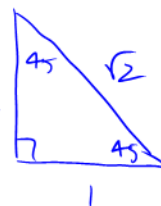
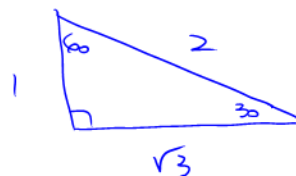
$$A = \frac{1}{2}bh$$

$$= \frac{1}{2}(3.75)(3.3)$$

$$\approx 6.2 \text{ cm}^2$$

4. Determine the exact value of  $\tan^2 45^\circ - \cos 30^\circ$ .

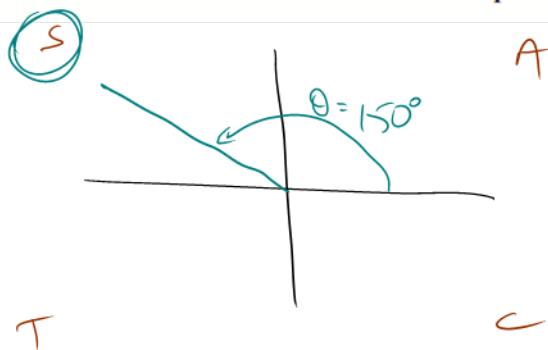
- a.  $2 - \frac{\sqrt{3}}{2}$   
 b.  $1 + \frac{\sqrt{3}}{2}$   
 c.  $1 - \sqrt{3}$   
 d.  $\frac{2 - \sqrt{3}}{2}$



$$\tan^2(45) - \cos(30) = \left(\frac{1}{1}\right)^2 - \frac{\sqrt{3}}{2} = \frac{1}{1} - \frac{\sqrt{3}}{2} = \frac{2 - \sqrt{3}}{2} \text{ (common denom)}$$

5. For the angle  $\theta = 150^\circ$  moving counter-clockwise in standard position, determine which primary trigonometric ratio is positive.

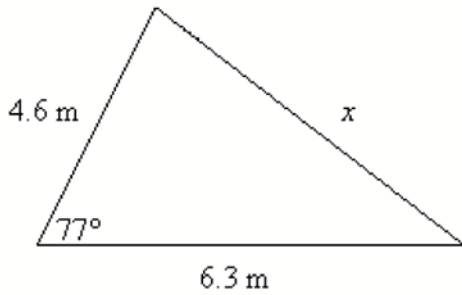
- a. sine  
 b. cosine  
 c. tangent  
 d. none are positive



$150^\circ$  is a quadrant 2 angle  
 $\Rightarrow$  sine is positive!



9. Determine  $x$  to the nearest tenth of a metre.



- a. 7.5 m  
b. 7.9 m  
c. 6.2 m  
d. 6.9 m

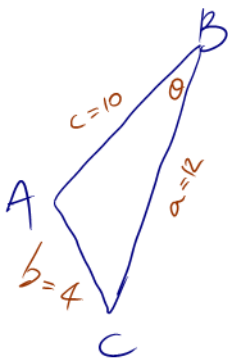
Not a right  $\Delta \Rightarrow$  NOT SOH CAH TOA } Boom!  
No corresponding pair  $\Rightarrow$  NOT SINE LAW } COSINE LAW

$$x^2 = 6.3^2 + 4.6^2 - 2(6.3)(4.6)\cos(77)$$

$$\Rightarrow x = \sqrt{\quad} = 6.9$$

10. A woman has a triangular garden with side lengths of 10 m, 12 m, and 4 m. Determine the angle between the side lengths of 10 m and 12 m to the nearest degree.

- a.  $15^\circ$   
b.  $16^\circ$   
c.  $17^\circ$   
d.  $18^\circ$



NO SOH CAH TOA  
NO SINE LAW

Boom! COSINE LAW  
(for angles!)

the cosine law - rearranged to isolate the angle.

$$\cos(B) = \frac{a^2 + c^2 - b^2}{2ac}$$

$$\Rightarrow \cos(B) = \frac{12^2 + 10^2 - 4^2}{2(12)(10)}$$

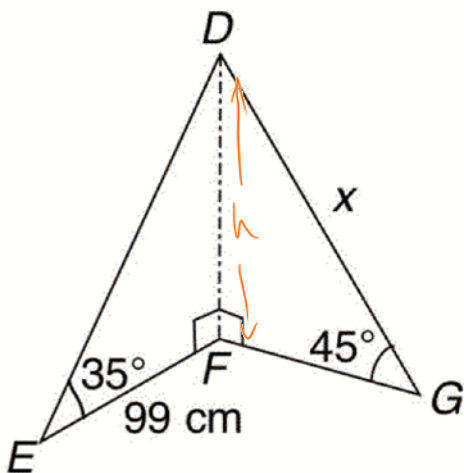
$$\Rightarrow B = \cos^{-1}\left(\frac{12^2 + 10^2 - 4^2}{2(12)(10)}\right) = 18^\circ$$

11. If 3 sides are known for a triangle, what piece of information can be found and what method is used?

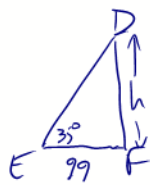
- a. side, sine law  
b. side, cosine law  
c. angle, sine law  
d. angle, cosine law

Taking a look at # 10 above - we found an angle using COSINE LAW

12. Determine the value of  $x$  to the nearest cm.

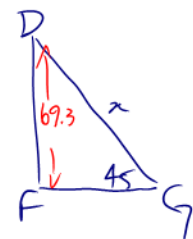


Note: DF is common to both  $\Delta$ s!  $\Rightarrow$  Find it!



$$\tan(35) = \frac{h}{99}$$

$$\Rightarrow h = (99)(\tan(35)) = 69.3$$



$$\sin(45) = \frac{69.3}{x}$$

$$\Rightarrow x = \frac{69.3}{\sin(45)} = 98 \text{ cm}$$

- a. 47 cm  
b. 68 cm  
c. 74 cm  
d. 98 cm