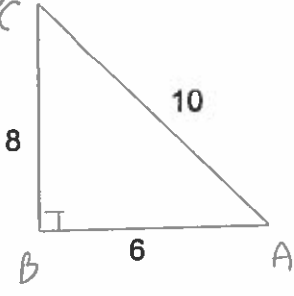


Calculator  
in  
Degrees

Math 1201 Final Exam Review Trigonometry

1. Write the RATIO for  $\sin \angle A$ ,  $\cos \angle A$  and  $\tan \angle A$ .

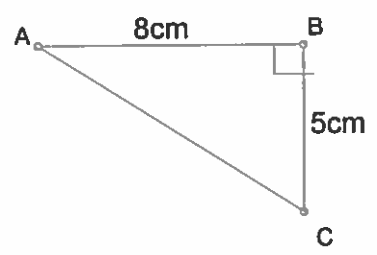


$$\sin A = \frac{o}{h} = \frac{8}{10} = \frac{4}{5}$$

$$\cos A = \frac{a}{h} = \frac{6}{10} = \frac{3}{5}$$

$$\tan A = \frac{o}{a} = \frac{8}{6} = \frac{4}{3}$$

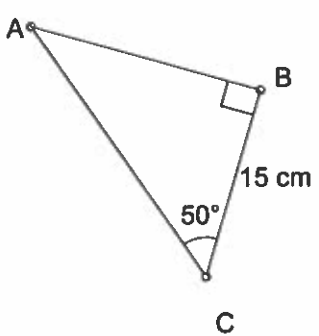
2. Find the value of  $\angle A$  to the nearest degree.



$$\tan A = \frac{o}{a} = \frac{5}{8}$$

$$\angle A = \tan^{-1}(5 \div 8) = 32^\circ$$

3. Find the length of side AB to the nearest tenth of a centimetre.



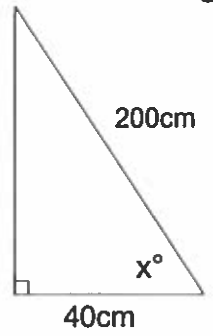
$$\tan C = \frac{o}{a}$$

$$\frac{\tan 50^\circ}{1} = \frac{x}{15}$$

$$x = 15(\tan 50^\circ)$$

$$= 17.9 \text{ cm}$$

4. Find the missing angle to the nearest degree.

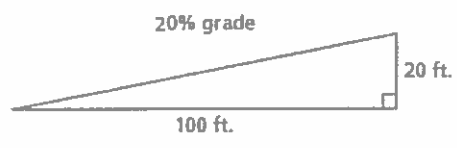


$$\cos X = \frac{a}{h}$$

$$\cos X = \frac{40}{200}$$

$$X = \cos^{-1}(40 \div 200) = 78^\circ$$

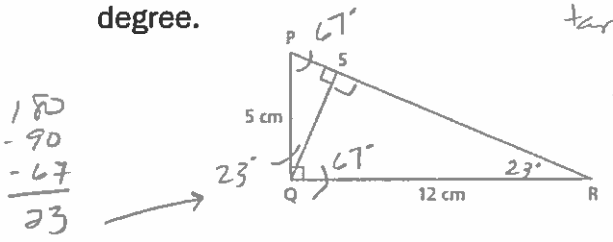
5. When a road has a grade of 20% it increases 20 ft in altitude for every 100 ft of horizontal distance. Calculate the angle of inclination, to the nearest degree, of a road with a grade of 20%.



$$\tan X = \frac{20}{100}$$

$$X = \tan^{-1}(20 \div 100) = 11^\circ$$

6. Determine the measures of all the acute angles in the diagram to the nearest degree.



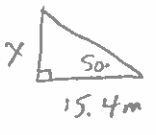
$$\tan \angle P = \frac{o}{a}$$

$$\tan P = \frac{12}{5}$$

$$\angle P = \tan^{-1}(12 \div 5) = 67^\circ$$

180  
- 90  
= 90  
- 67  
= 23

7. A guy wire helps to support a tower. The angle between the wire and the ground is  $50^\circ$ . One end of the wire is 15.4m from the base of the tower. How high up the tower does the wire reach to the nearest tenth of a metre?

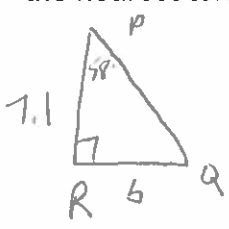


$$\tan 50^\circ = \frac{x}{15.4}$$

$$x = 15.4 \tan 50^\circ$$

$$= 18.4 \text{ m}$$

8. In  $\triangle PQR$ ,  $\angle R = 90^\circ$ ,  $\angle P = 58^\circ$  and  $PR = 7.1$  cm. Determine the area of the triangle to the nearest tenth of a centimetre.



$$A = \frac{1}{2} b(h)$$

$$= \frac{1}{2} (b)(7.1)$$

$$= \frac{1}{2} (11.4)(7.1)$$

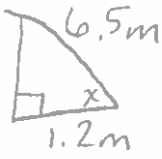
$$= 40.5 \text{ cm}^2$$

$$\tan 58^\circ = \frac{o}{a}$$

$$\tan 58^\circ = \frac{b}{7.1}$$

$$b = 7.1 \tan 58^\circ = 11.4 \text{ cm}$$

9. A ladder 6.5m long is resting on a building. The base of the ladder is 1.2m from the wall. What is the angle of inclination of the ladder to the nearest degree?

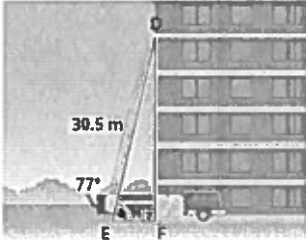


$$\cos x = \frac{a}{h}$$

$$\cos x = \frac{1.2}{6.5}$$

$$x = \cos^{-1}(1.2 \div 6.5) = 79^\circ$$

10. A fire truck has an aerial ladder that extends 30.5m measured from the ground. The angle of inclination of the ladder is  $77^\circ$ . How far up the wall of an apartment building can the ladder reach?



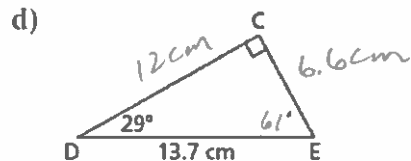
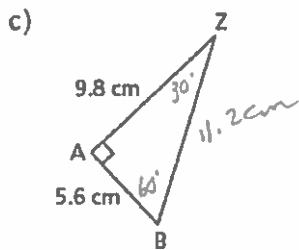
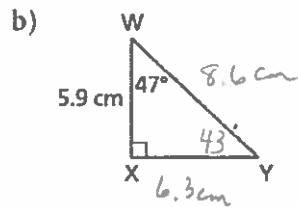
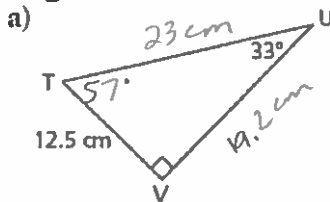
$$\sin 77 = \frac{o}{h}$$

$$\frac{\sin 77}{1} = \frac{x}{30.5}$$

$$x = 30.5 (\sin 77)$$

$$x = 29.7 \text{ m}$$

11. Solve each triangle.



a)  $\sin 33 = \frac{o}{h}$

$$\frac{\sin 33}{1} = \frac{12.5}{v}$$

$$v (\sin 33) = 12.5$$

$$v = \frac{12.5}{\sin 33}$$

$$v = 23 \text{ cm}$$

$$\tan 33 = \frac{o}{a}$$

$$\frac{\tan 33}{1} = \frac{12.5}{t}$$

$$t \tan 33 = 12.5$$

$$t = \frac{12.5}{\tan 33}$$

$$t = 19.2 \text{ cm}$$

b)  $\tan 47 = \frac{o}{a}$

$$\frac{\tan 47}{1} = \frac{w}{5.9}$$

$$w = 5.9 \tan 47$$

$$w = 6.3 \text{ cm}$$

$$(5.9)^2 + (6.3)^2 = x^2$$

$$34.81 + 39.69 = x^2$$

$$x^2 = 74.5$$

$$x = \sqrt{74.5}$$

$$x = 8.6$$

c)  $\tan Z = \frac{o}{a}$

$$\tan Z = \frac{5.6}{9.8}$$

$$Z = \tan^{-1}\left(\frac{5.6}{9.8}\right)$$

$$Z = 30^\circ$$

$$\sin 30 = \frac{o}{h}$$

$$\frac{\sin 30}{1} = \frac{5.6}{a}$$

$$\frac{a \sin 30}{\sin 30} = \frac{5.6}{\sin 30}$$

$$a = 11.2$$

d)  $\sin 29 = \frac{o}{h}$

$$\frac{\sin 29}{1} = \frac{d}{13.7}$$

$$d = 13.7 \sin 29$$

$$d = 6.6$$

$$\sin 61 = \frac{o}{h}$$

$$\frac{\sin 61}{1} = \frac{e}{13.7}$$

$$e = 13.7 \sin 61$$

$$e = 12 \text{ cm}$$

12. An architect draws this diagram of a wheelchair ramp for a building. Determine the length of the ramp.



$$\sin 4 = \frac{o}{h}$$

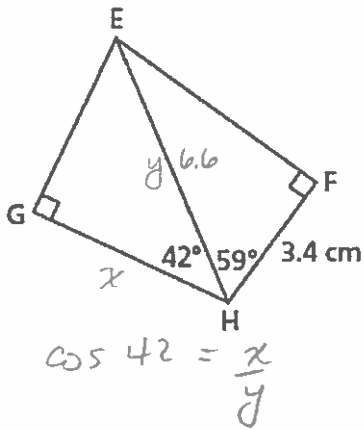
$$\frac{\sin 4}{1} = \frac{80}{x}$$

$$\frac{x \sin 4}{\sin 4} = \frac{80}{\sin 4}$$

$$x = 1146.8 \text{ cm} \quad 11.5 \text{ m}$$

13. Calculate the length of GH to the nearest tenth of a centimetre.

b)



$$\cos 59^\circ = \frac{3.4}{y}$$

$$y \cos 59^\circ = \frac{3.4}{\cos 59^\circ}$$

$$y = 6.6 \text{ cm}$$

$$\cos 42^\circ = \frac{x}{6.6}$$

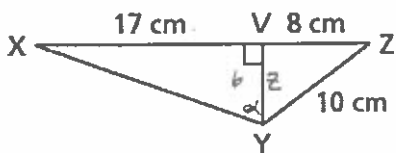
$$x = 6.6 \cos 42^\circ$$

$$x = 4.9 \text{ cm}$$

$$GH = 4.9 \text{ cm}$$

14. Calculate the measure of  $\angle XYZ$  to the nearest degree.

b)



$$8^2 + z^2 = 10^2$$

$$64 + z^2 = 100$$

$$z^2 = 36$$

$$z = 6$$

$$\tan \alpha = \frac{6}{17}$$

$$\tan \alpha = \frac{6}{17}$$

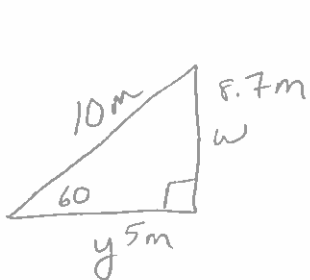
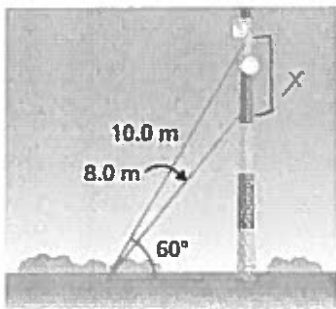
$$\alpha = \tan^{-1}\left(\frac{6}{17}\right)$$

$$\alpha = 19.4^\circ$$

$$\angle XYZ = 71^\circ$$

15. A communications tower has many guy wires to support it. Two of these guy wires are 8.0 m and 10.0 m long. They are attached to the same point on the ground. The longer wire has an angle of inclination of  $60^\circ$ .

How far apart are the wires?

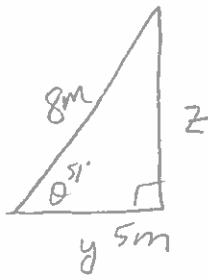


$$\sin 60^\circ = \frac{a}{h} = \frac{w}{10}$$

$$\frac{\sin 60}{1} = \frac{w}{10}$$

$$w = 10 \sin 60$$

$$w = 8.7$$



$$\tan 60^\circ = \frac{a}{a}$$

$$\tan 60 = \frac{8.7}{y}$$

$$\frac{y \tan 60}{\tan 60} = \frac{8.7}{\tan 60}$$

$$y = 5$$

$$\cos \theta = \frac{a}{h}$$

$$\cos \theta = \frac{5}{8}$$

$$\theta = \cos^{-1}(5/8)$$

$$\theta = 51^\circ$$

$$\tan 51 = \frac{z}{a}$$

$$\frac{\tan 51}{1} = \frac{z}{5}$$

$$z = 5 \tan 51$$

$$z = 6.2 \text{ m}$$

$$x = w - z$$

$$= 8.7 - 6.2$$

$$= \boxed{2.5 \text{ m}}$$

