

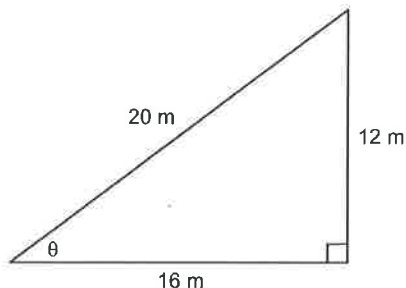
Chapter 7/8 Review

ANSWERS

Section 1: Finding Trig Ratios

Find $\sin \theta$, $\cos \theta$, and $\tan \theta$ to the nearest hundredth for each triangle (don't solve for the angle, just find the ratio)

1)

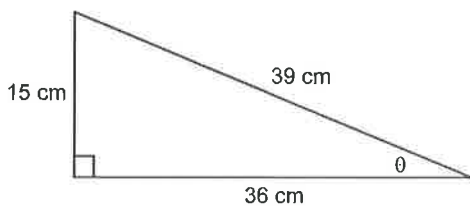


$$\sin \theta : \underline{0.6}$$

$$\cos \theta : \underline{0.8}$$

$$\tan \theta : \underline{0.75}$$

2)

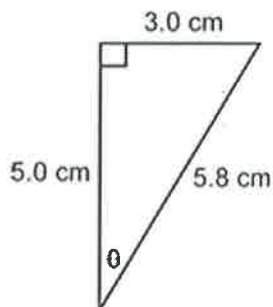


$$\sin \theta : \underline{0.38}$$

$$\cos \theta : \underline{0.92}$$

$$\tan \theta : \underline{0.42}$$

3)



$$\sin \theta : \underline{0.52}$$

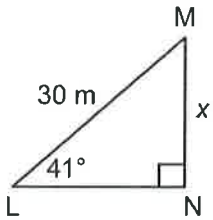
$$\cos \theta : \underline{0.86}$$

$$\tan \theta : \underline{0.6}$$

Section 2: Finding Side Lengths of Right Triangles

Find the value of x , to the nearest tenth

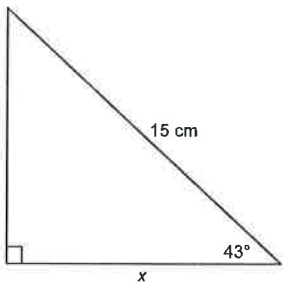
4)



$$\sin 41 = \frac{x}{30}$$

$$x = 19.7\text{ m}$$

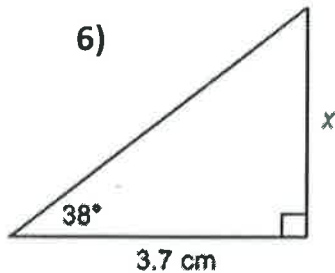
5)



$$\cos 43 = \frac{x}{15}$$

$$x = 11.0\text{ cm}$$

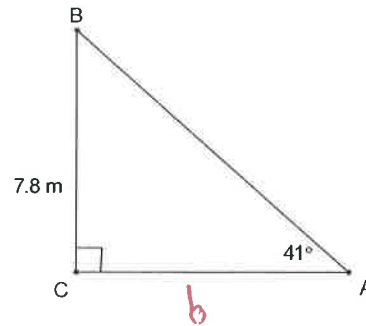
6)



$$\tan 38 = \frac{x}{3.7}$$

$$x = 2.9\text{ cm}$$

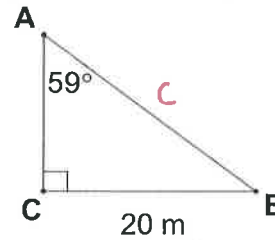
7) Find the length of side 'b'



$$\tan 41 = \frac{7.8}{b}$$

$$b = 9.0\text{ m}$$

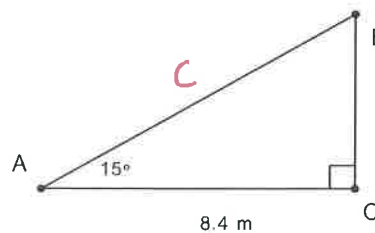
8) Find the length of side 'c'



$$\sin 59 = \frac{20}{c}$$

$$c = 23.3\text{ m}$$

9) Find the length of side 'c'

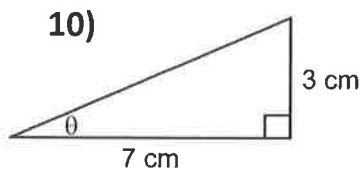


$$\cos 15 = \frac{8.4}{c}$$

$$c = 8.7\text{ m}$$

Section 3: Finding Angles of Right Triangles

Find the value of angle θ in the following triangles:

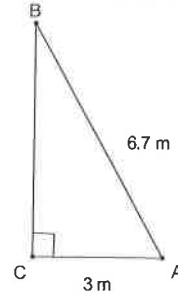


$$\tan \theta = \frac{3}{7}$$

$$\theta = 23.2^\circ$$

Find the measure of the following angles:

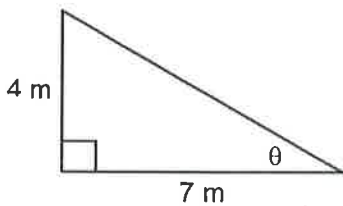
13) Find angle 'A'



$$\cos A = \frac{3}{6.7}$$

$$\angle A = 63.4^\circ$$

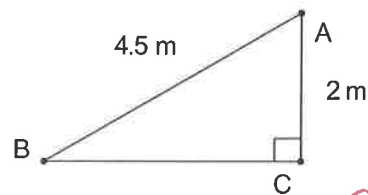
11)



$$\tan \theta = \frac{4}{7}$$

$$\theta = 29.7^\circ$$

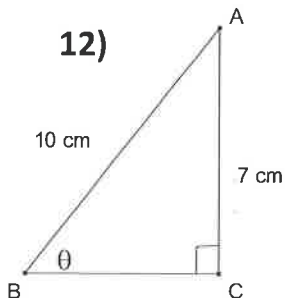
14) Find angle 'B'



$$\sin B = \frac{2}{4.5}$$

$$\angle B = 26.4^\circ$$

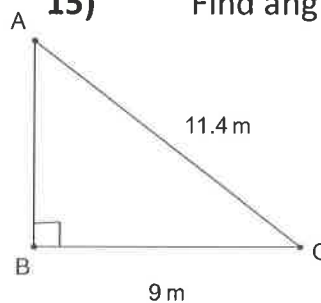
12)



$$\sin \theta = \frac{7}{10}$$

$$\theta = 44.4^\circ$$

15) Find angle 'C'

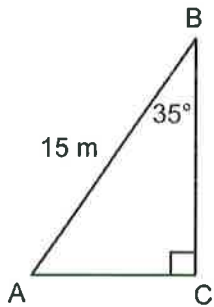


$$\cos C = \frac{9}{11.4}$$

$$\angle C = 37.9^\circ$$

Section 4: Solve the Following Right Triangles

16)



$$\cos 35 = \frac{a}{15}$$

$$a = 12.3 \text{ m}$$

$$\sin 35 = \frac{b}{15}$$

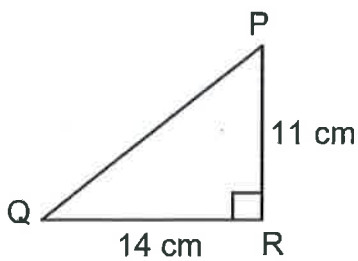
$$b = 8.6 \text{ m}$$

$$a = \underline{12.3 \text{ m}}$$

$$b = \underline{8.6 \text{ m}}$$

$$\angle A = \underline{55^\circ}$$

17)



$$r^2 = 14^2 + 11^2$$

$$r = 17.8 \text{ cm}$$

$$\tan P = \frac{14}{11}$$

$$\angle P = 51.8^\circ$$

$$r = \underline{17.8 \text{ cm}}$$

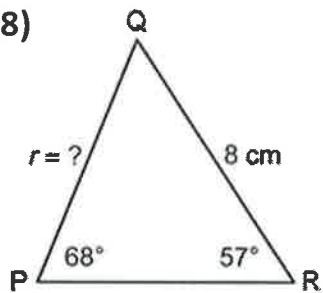
$$\angle P = \underline{51.8^\circ}$$

$$\angle Q = \underline{38.2^\circ}$$

Section 5: Sine Law

Find the length of the indicated side or angle of each acute triangle

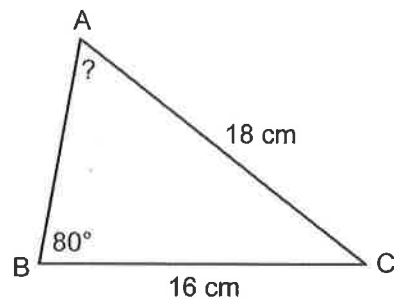
18)



$$\frac{8}{\sin 68} = \frac{r}{\sin 57}$$

$$r = 7.2 \text{ cm}$$

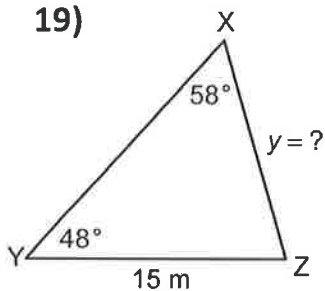
21)



$$\frac{18}{\sin 80} = \frac{16}{\sin A}$$

$$\angle A = 61.1^\circ$$

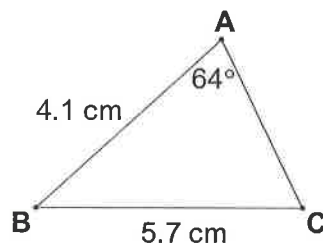
19)



$$\frac{15}{\sin 58} = \frac{y}{\sin 48}$$

$$y = 13.1 \text{ m}$$

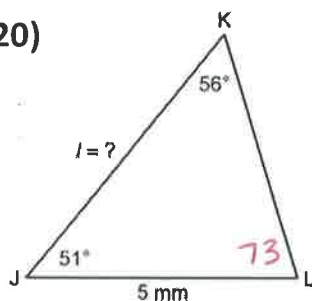
22) Find Angle C



$$\frac{4.1}{\sin C} = \frac{5.7}{\sin 64}$$

$$\angle C = 40.3^\circ$$

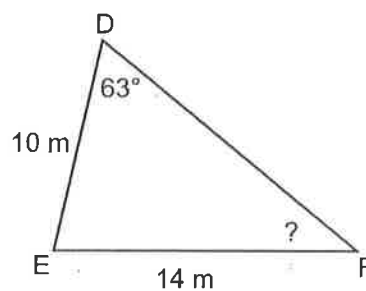
20)



$$\frac{l}{\sin 73} = \frac{5}{\sin 56}$$

$$l = 5.8 \text{ mm}$$

23)



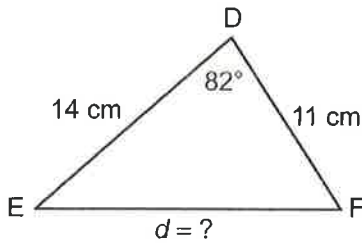
$$\frac{10}{\sin F} = \frac{14}{\sin 63}$$

$$\angle F = 39.5^\circ$$

Section 6: Cosine Law

Find the length of the unknown side

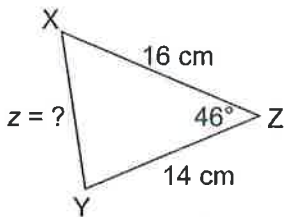
24)



$$d^2 = 14^2 + 11^2 - 2(14)(11)\cos(82)$$

$$d = 16.6 \text{ cm}$$

25)

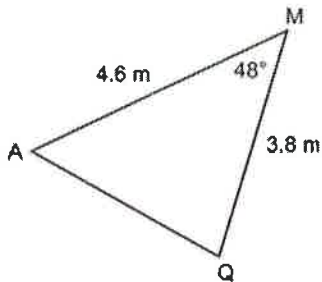


$$z^2 = 14^2 + 16^2 - 2(14)(16)\cos(46)$$

$$z = 11.9 \text{ cm}$$

26)

Find the length of m

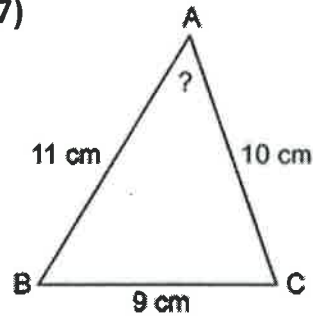


$$m^2 = 4.6^2 + 3.8^2 - 2(4.6)(3.8)\cos(48)$$

$$m = 3.5 \text{ m}$$

Find the measure of the unknown angle

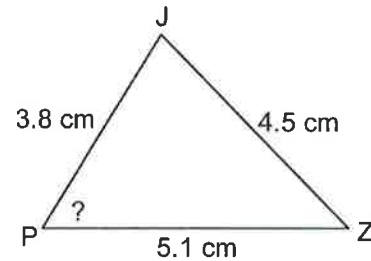
27)



$$\cos(A) = \frac{9^2 - 11^2 - 10^2}{-2(11)(10)}$$

$$\angle A = 50.5^\circ$$

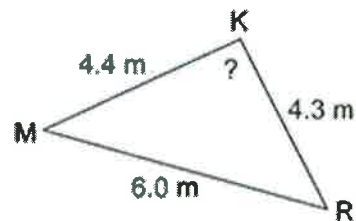
28)



$$\cos(P) = \frac{4.5^2 - 3.8^2 - 5.1^2}{-2(3.8)(5.1)}$$

$$\angle P = 58.6^\circ$$

29)

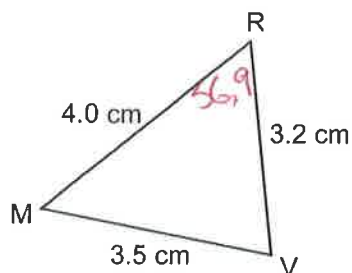


$$\cos(K) = \frac{6^2 - 4.4^2 - 4.3^2}{-2(4.4)(4.3)}$$

$$\angle K = 87.2^\circ$$

Section 7: Solve Each Acute Triangle

30)



$$\cos(R) = \frac{3.5^2 + 4^2 - 3.2^2}{-2(4)(3.2)}$$

$$\angle R = 56.9^\circ$$

$$\frac{3.5}{\sin 56.9} = \frac{4}{\sin V}$$

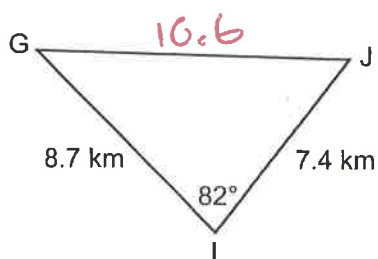
$$\angle V = 73.2$$

$$\text{Angle R} = \underline{56.9^\circ}$$

$$\text{Angle M} = \underline{49.9^\circ}$$

$$\text{Angle V} = \underline{73.2^\circ}$$

31)



$$l^2 = 8.7^2 + 7.4^2 - 2(8.7)(7.4)\cos(82)$$

$$l = 10.6 \text{ km}$$

$$\frac{10.6}{\sin 82} = \frac{8.7}{\sin J}$$

$$\angle J = 54.4^\circ$$

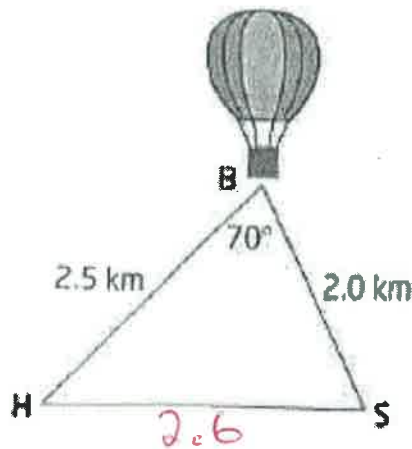
$$\text{Angle G} = \underline{43.6^\circ}$$

$$\text{Angle J} = \underline{54.4^\circ}$$

$$\text{side } l = \underline{10.6 \text{ km}}$$

Section 8: Applications

- 32) Chandra is riding in a hot-air balloon and spots her house and her school. She estimates how far away they are from her, and the angle separating their lines of sight, as shown.



- a) How far apart are Chandra's home and school, to the nearest tenth of a kilometer?

$$b^2 = 2.5^2 + 2^2 - 2(2.5)(2)\cos(70)$$

$$b = 2.6 \text{ km}$$

- b) Chandra's mom is watching her from home, and her friends are watching from school. At what angle of elevation does Chandra appear to each of them, to the nearest degree.

From Home

$$\frac{2.6}{\sin 70} = \frac{2}{\sin H}$$

$$\angle H = 46.3^\circ$$

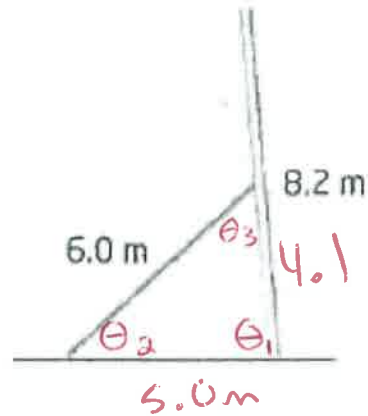
From School

$$\frac{2.5}{\sin S} = \frac{2.6}{\sin 70}$$

$$\angle S = 64.6^\circ$$

Note: - Due to rounding the angles do not add to 180.
- your answers may vary slightly.

- 33) A leaning pole is braced at its midpoint as shown. The pole is 8.2 meters long and the bracing beam is 6.0 meters long. The foot of the beam is placed 5.0 meters from the base of the pole. Determine to the nearest degree:



- a) The angle the pole makes with the ground

$$\cos(\theta_1) = \frac{6^2 - 5^2 - 4.1^2}{-2(5)(4.1)}$$

$$\theta_1 = 81.9^\circ$$

- b) The angle the beam makes with the ground

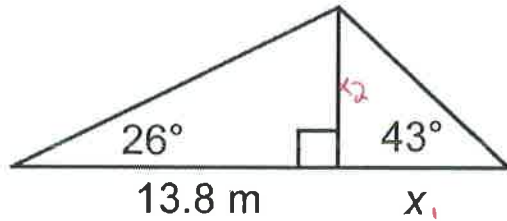
$$\cos(\theta_2) = \frac{4.1^2 - 6^2 - 5^2}{-2(6)(5)}$$

$$\theta_2 = 42.6^\circ$$

- c) The angle the beam makes with the pole

$$\theta_3 = 55.5^\circ$$

34) Find the length of x , to the nearest tenth of a centimeter



$$\tan 26 = \frac{x_2}{13.8}$$

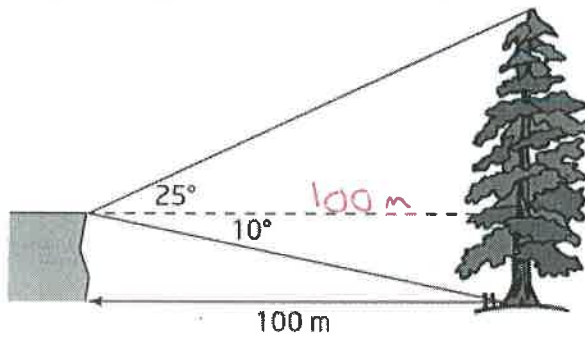
$$x_2 = 6.73 \text{ m}$$

$$\tan 43 = \frac{6.73}{x_1}$$

$$x_1 = 7.2 \text{ m}$$

35)

From a rock ledge the angle of elevation to the top of a tree is 25° . The angle of depression to the bottom of the tree is 10° .



a) Find the height of the rock ledge to the nearest tenth of a metre.

$$\tan 10 = \frac{x_1}{100}$$

$$x_1 = 17.6 \text{ m}$$

b) Find the height of the tree to the nearest tenth of a metre.

$$\tan 25 = \frac{x_2}{100}$$

$$x_2 = 46.6 \text{ m}$$

$$\begin{aligned} \text{height} &= x_1 + x_2 \\ &= 64.2 \text{ m} \end{aligned}$$