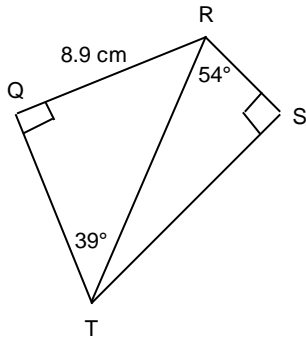


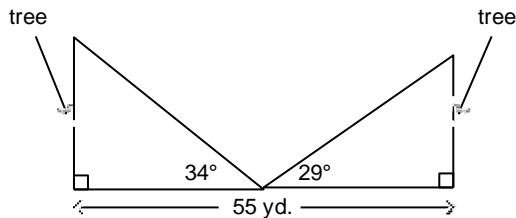
Multiple Triangle Trig Problems

Short Answer

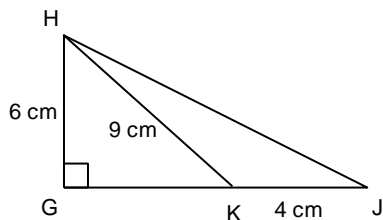
1. Determine the length of RS to the nearest tenth of a centimetre.



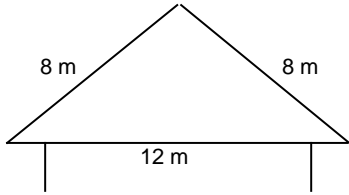
2. Two trees are 55 yd. apart. From a point halfway between the trees, the angles of elevation of the tops of the trees are measured. What is the height of each tree to the nearest yard?



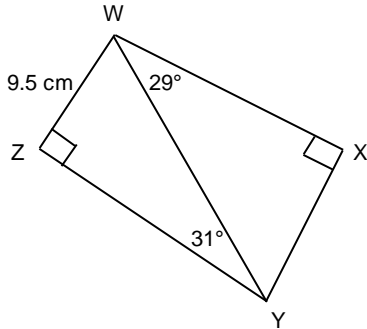
3. Calculate the measure of $\angle GHJ$ to the nearest tenth of a degree.



4. From the top of a 25-m lookout tower, a fire ranger observes one fire due east of the tower at an angle of depression of 7° . She sees another fire due north of the tower at an angle of depression of 3° . How far apart are the fires to the nearest metre?
5. Two trees are 96 m apart. From a point halfway between the trees, the angles of elevation of the tops of the trees are 10° and 19° . To the nearest tenth of a metre, how much taller is one tree than the other?
6. A roof has the shape of an isosceles triangle with equal sides 8 m long and base 12 m long. What is the measure of the angle of inclination of the roof to the nearest degree?

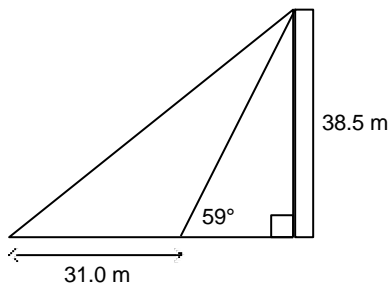


7. Determine the length of WX to the nearest tenth of a centimetre.

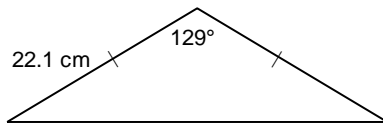


Problem

8. A Girl Guide measured the angle of elevation of the top of a monument as 59° . The height of the monument is 38.5 m. She then walked 31.0 m due west from the point where she measured the angle of elevation. Determine the angle of elevation of the monument from her new location to the nearest tenth of a degree.



9. Determine the area of this triangle to the nearest tenth of a square centimetre.



Multiple Triangle Trig Problems Answer Section

SHORT ANSWER

1. ANS:
8.3 cm
2. ANS:
19 yd.; 15 yd.
3. ANS:
 60.7°
4. ANS:
519 m
5. ANS:
8.1 m
6. ANS:
 41°
7. ANS:
16.1 cm

PROBLEM

8. ANS:
Label a diagram.
Use right $\triangle ACD$ to calculate the length of CD. AD is opposite $\angle ACD$ and CD is adjacent to $\angle ACD$.
So, use the tangent ratio.

$$\tan C = \frac{\text{opposite}}{\text{adjacent}}$$

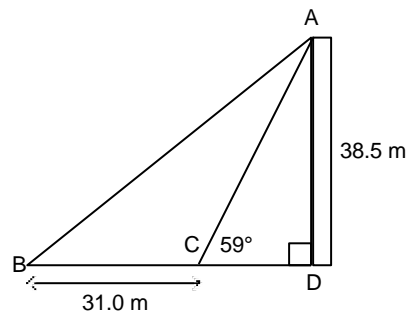
$$\tan C = \frac{AD}{CD}$$

$$\tan 59^\circ = \frac{38.5}{CD}$$

$$CD \tan 59^\circ = 38.5$$

$$CD = \frac{38.5}{\tan 59^\circ}$$

$$CD = 23.1331\dots$$



Use right $\triangle ABD$ to calculate the measure of $\angle B$.

First determine the length of BD .

$$BD = BC + CD$$

$$BD = 31.0 + 23.1331\dots$$

$$BD = 54.1331\dots$$

Determine the measure of $\angle B$.

AD is opposite $\angle B$ and BD is adjacent to $\angle B$.

So, use the tangent ratio.

$$\tan B = \frac{\text{opposite}}{\text{adjacent}}$$

$$\tan B = \frac{AD}{BD}$$

$$\tan B = \frac{38.5}{54.1331\dots}$$

$$\angle B = 35.4207\dots^\circ$$

The angle of elevation of the monument from the new location is approximately 35.4° .

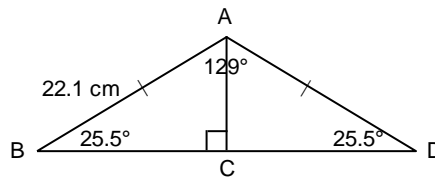
9. ANS:

Label a diagram.

$\triangle ABD$ is an isosceles triangle, so each base angle is:

$$= \frac{180^\circ - 129^\circ}{2}$$

$$= 25.5^\circ$$



Determine the height, AC , of the triangle.

In right $\triangle ABC$, AC is opposite $\angle B$ and AB is the hypotenuse.

So, use the sine ratio in $\triangle ABC$.

$$\sin B = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\sin B = \frac{AC}{AB}$$

$$\sin 25.5^\circ = \frac{AC}{22.1}$$

$$22.1 \sin 25.5^\circ = AC$$

$$AC = 9.5142\dots$$

Determine the length of the base, BD , of $\triangle ABD$

$$BD = 2(BC)$$

In right $\triangle ABC$, BC is adjacent to $\angle B$ and AB is the hypotenuse.

So, use the cosine ratio in $\triangle ACB$.

$$\cos B = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\cos B = \frac{BC}{AB}$$

$$\cos 25.5^\circ = \frac{BC}{22.1}$$

$$22.1 \cos 25.5^\circ = BC$$

$$BC = 19.9471\dots$$

The base, BD, is:

$$BD = 2(BC)$$

$$BD = 2(19.9471\dots)$$

$$BD = 39.8942\dots$$

The formula for Area, A , of a triangle is:

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

$$A = \frac{1}{2}(39.8942\dots)(9.5142\dots)$$

$$A = 189.7829\dots$$

The area of the triangle is approximately 189.8 cm^2 .