

State all answers accurate to one decimal place!

1. Solve $\triangle ABC$ given that:

a) $\angle C = 90^\circ, a = 8, b = 12$

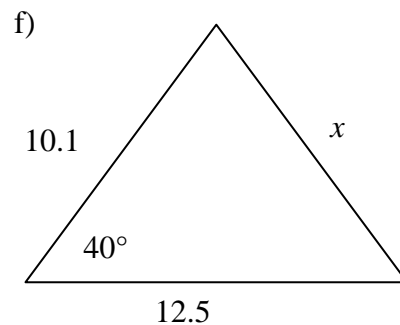
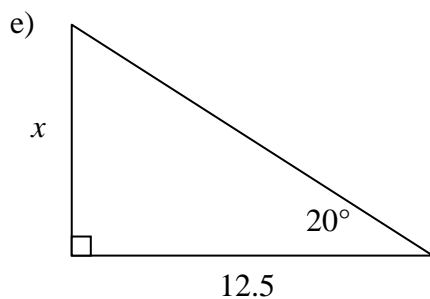
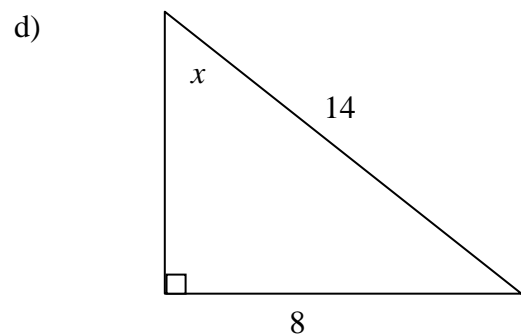
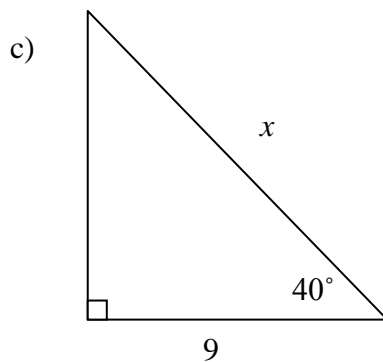
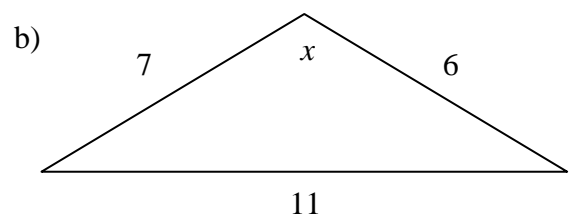
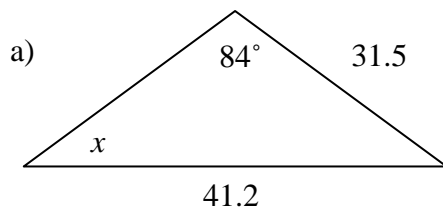
b) $\angle A = 90^\circ, \angle B = 32^\circ, a = 12$

c) $\angle A = 80^\circ, b = 3, c = 8$

d) $\angle B = 31^\circ, \angle C = 81^\circ, a = 9$

e) $a = 8, b = 7, c = 6$

2. In each of the following triangles, determine the value of the marked unknown:



3. In a given right triangle, $\tan \theta = \frac{2}{3}$. Determine the values of the other two primary trig ratios. Express your answer in square root form.

4. The angle of depression of a ship from the “look-out” deck of a lighthouse is 16° . How far is the ship from the base of the lighthouse if the deck is 22.5 metres above the ground?

5. From a point A, the angle of elevation of the top of a tower is 28° . From another point B, **on the opposite side** of the tower, the angle of elevation is 35° . Assuming that the tower and the two points are in a direct line on level ground, determine the height of the tower, given that the distance between A and B is 410 metres.
6. Determine the area of $\triangle ABC$ if $\angle B = 32^\circ$, $a = 31.5\text{ cm}$ and $c = 26.3\text{ cm}$.
7. Two cars leave the same town. The first car leaves at 2:30 and drives due east at 90 km/h. The second car leaves at 3:00 and drives in a direction $N30^\circ W$ (30° west of due north), at a speed of 110 km/h. How far apart are the cars at 5:00?
8. A ladder is in an unsafe position if it makes an angle of less than 14.5° with the wall. A 10 metre ladder is placed with its base 3 metres from the bottom of the wall. Is the ladder in a safe position?
9. Determine the area of a triangle which has sides with lengths 17 cm, 29 cm and 23 cm.

Answers

1. a) $c \doteq 14.4$, $\angle A \doteq 33.7^\circ$, $\angle B \doteq 56.3^\circ$
b) $\angle C = 58^\circ$, $b \doteq 6.4$, $c \doteq 10.2$
c) $a \doteq 8.0$, $\angle B \doteq 21.6^\circ$, $\angle C \doteq 78.4^\circ$
d) $\angle A = 68^\circ$, $b \doteq 5.0$, $c \doteq 9.6$
e) $\angle A \doteq 75.5^\circ$, $\angle B \doteq 57.9^\circ$, $\angle C \doteq 46.6^\circ$
2. a) $x \doteq 49.5^\circ$ b) $x \doteq 115.4^\circ$ c) $x \doteq 11.7$
d) $x \doteq 34.8^\circ$ e) $x \doteq 4.5$ f) $x \doteq 8.1$
3. $\sin \theta = \frac{2}{\sqrt{13}}$ $\cos \theta = \frac{3}{\sqrt{13}}$
4. The ship is about 78.5 metres away.
5. The tower is about 123.9 meters tall.
6. The area of the triangle is about 219.5 square units.
7. The cars are about 385.4 km apart.
8. The ladder is in a safe position because the angle is about 17.5° .
9. The area of the triangle is about 195.4 square units.