The Sine Law

1. Solve for the unknown side or angle in each of the following. Answer for sides rounded to 1 decimal place and angles to the nearest degree.

a. $\dfrac{\sin 25°}{a} = \dfrac{\sin 63°}{14}$

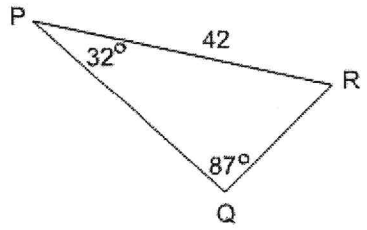
b. $\dfrac{\sin 10°}{12} = \dfrac{\sin 83°}{d}$

c. $\dfrac{\sin P}{17} = \dfrac{\sin 35°}{12}$

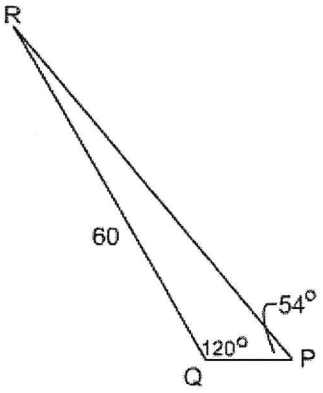
d. $\dfrac{\sin 72°}{78} = \dfrac{\sin U}{54}$

2. Determine the length of PQ in each triangle rounded to 1 decimal place.

a.

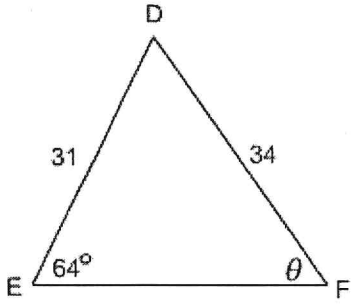


b.

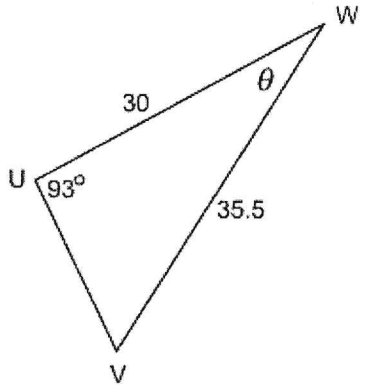


3. Determine the measure of angle θ to the nearest degree.

a.

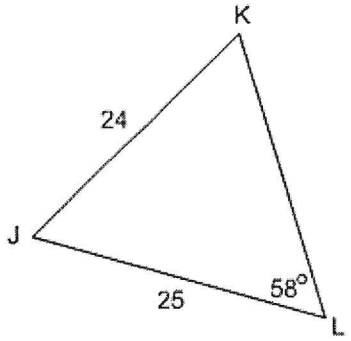


b.

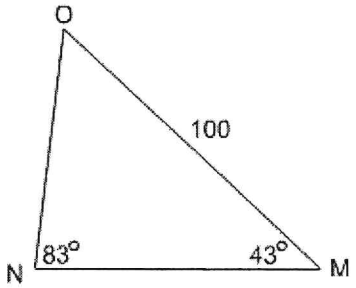


4. Solve each triangle. (Means to find all unknown sides rounded to 1 decimal place and angles to the nearest degree)

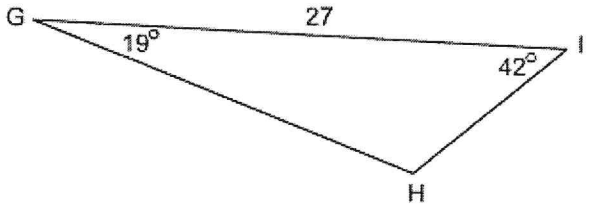
a.



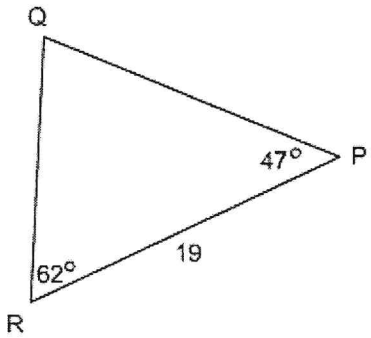
b.



c.



d.



5. Two docks are 168 m apart. From one dock Dave swims out to an Island and then swims back to the other dock. The angles between the line joining each dock to the island, and the line joining the docks are $64°$ and $70°$. How far must Dave swim? Answer to the nearest metre.

6. To measure the distance across a river a baseline AB is established along one shore of the river and measured to be 80 m. From A to a large rock on the shore across the river the angle is measured to be $85°$ with baseline AB, and then from B to the same rock the angle measured is 30 degrees with baseline AB. Determine the distance across the river. Answer to the nearest metre.

7. Two lighthouses, one at Brown's Bay and one at Ripple Rock are 35 kilometres apart. Brown's Bay is due north of Ripple Rock. The lighthouse keeper at Brown's Bay spots a ship $S35°E$. At the same instant the lighthouse keeper at Ripple Rock spots the ship at $N57°E$. How far is the ship from each lighthouse? Answer to the nearest km.

8. A flagpole is tilted at an angle of $7°$ from the vertical and toward the sun. It casts a shadow of 14.3 m when the angle of elevation of the sun is $32°$. Find the length of the flagpole. Answer to the nearest tenth of a metre.

9. Canada's highest waterfall is Della falls on Vancouver Island. An observer standing at the same level as the base of the falls views the top of the falls at an angle of elevation of $58°$. When the observer moves 31 m closer to the base of the falls the angle of elevation increases to $61°$. Find the height of Della Falls. Answer to the nearest metre.

ANSWERS

1*a*) 6.6 1*b*) 68.6 1*c*) 54° 1*d*) 41°

2*a*) 36.8 2*b*) 7.8

3*a*) 55° 3*b*) 29°

4*a*) $\angle J = 60°$, $\angle K = 62°$, $KL = 24.5$

4*b*) $\angle O = 54°$, $NO = 68.7$, $MN = 81.5$

4*c*) $\angle H = 119°$, $HI = 10.1$, $GH = 20.7$

4*d*) $\angle Q = 71°$, $PQ = 17.7$, $QR = 14.7$

5) 429 *m*

6) 44.1 *m*

7) 29 *km from Brown's Bay*
20 *km from Ripple Rock*

8) 9.8*m*

9) 439*m*