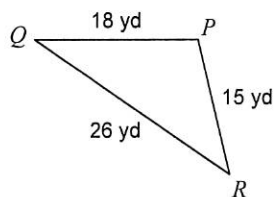


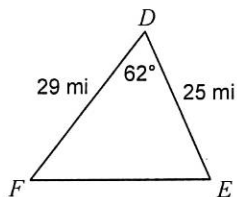
Section 9.4 Law of Cosines

Solve each triangle. Round your answers to the nearest tenth.

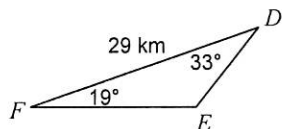
1)



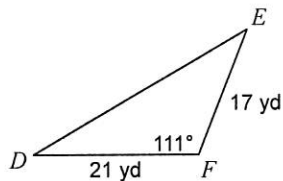
2)



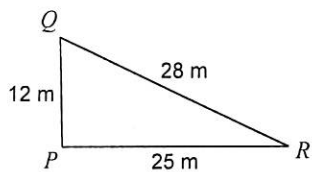
3)



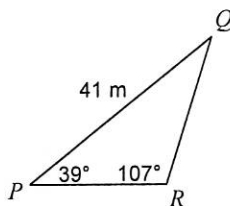
4)



5)



6)



7) In $\triangle XYZ$, $y = 24$ ft, $x = 28$ ft, $z = 22$ ft

8) In $\triangle QRP$, $r = 14$ cm, $m\angle Q = 126.4^\circ$, $p = 24$ cm

9) In $\triangle CAB$, $b = 9$ yd, $m\angle C = 123^\circ$, $a = 18$ yd

10) In $\triangle STR$, $t = 21$ m, $r = 17$ m, $m\angle S = 90^\circ$

11) In $\triangle PKH$, $k = 26$ cm, $h = 18$ cm, $p = 24$ cm

- 12) Two sides and a diagonal of a parallelogram are 7, 9, and 15 in respectively. Find the measures of the angles of the parallelogram.
- 13) A baseball player in center field is playing approximately 330 feet from the television camera that is behind home plate. A batter hit a fly ball that goes to the wall that is 420 feet from the camera. Approximate the number of feet the center fielder had to run to make the catch if the camera turned 9 degrees following the play.
- 14) A bicycle race follows a triangular course. The three legs of the course are in order, 2.3 km., 5.9 km. and 6.2 km. Find the angle between the starting leg and the finishing leg to the nearest degree.
- 15) A boat leaves Kingston and heads due east for 25 km. At the same time a second boat travels at a direction of 30° south of east from Kingston for 15 km. How far apart are the boats when they reach their destinations.

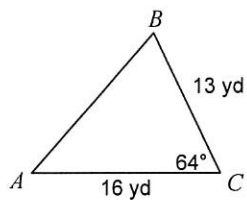
Find the area of each triangle to the nearest tenth.

$$s = \frac{1}{2}(a + b + c)$$

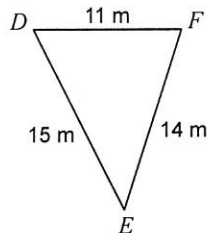
$$A = \frac{1}{2}bc \sin A$$

$$A = \sqrt{s(s-a)(s-b)(s-c)}$$

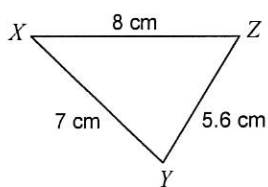
16)



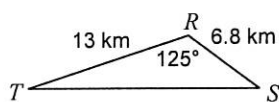
17)



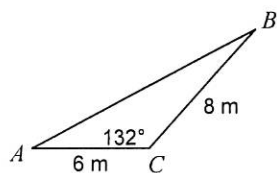
18)



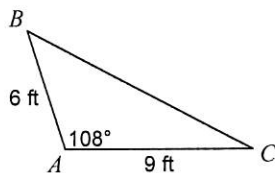
19)



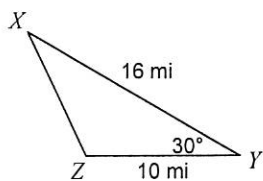
20)



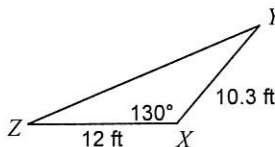
21)



22)



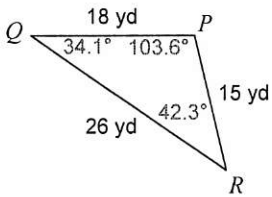
23)



Section 9.4 Law of Cosines

Solve each triangle. Round your answers to the nearest tenth.

1)



$$26^2 = 18^2 + 15^2 - 2(18)(15)\cos P$$

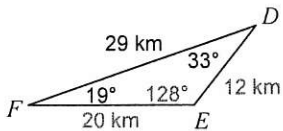
$$P \approx 104^\circ$$

$$\frac{\sin 104}{26} = \frac{\sin R}{18}$$

$$R \approx 44^\circ$$

$$Q \approx 32^\circ$$

3)



$$E = 128^\circ$$

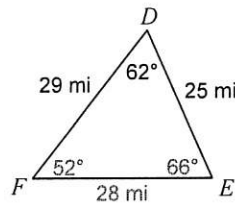
$$f = 12$$

$$d = 20$$

$$\frac{\sin 128}{29} = \frac{\sin 19}{f}$$

$$\frac{\sin 128}{29} = \frac{\sin 33}{d}$$

2)



$$d^2 = 29^2 + 25^2 - 2(29)(25)\cos 62$$

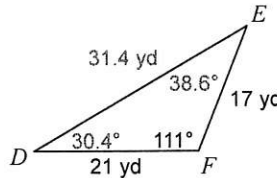
$$d \approx 28$$

$$\frac{\sin 62}{28} = \frac{\sin F}{25}$$

$$F \approx 52^\circ$$

$$E = 66^\circ$$

4)



$$f^2 = 21^2 + 17^2 - 2(21)(17)\cos 111^\circ$$

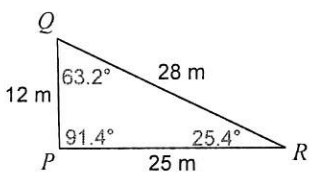
$$\frac{\sin 111}{31.4} = \frac{\sin E}{21}$$

$$f = 31.4$$

$$E = 39^\circ$$

$$D = 30^\circ$$

5)



$$\frac{\sin 25}{12} = \frac{\sin Q}{25}$$

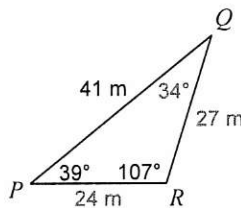
$$12^2 = 28^2 + 25^2 - 2(28)(25)\cos R$$

$$R \approx 25^\circ$$

$$Q \approx 93^\circ$$

$$Q = 62^\circ$$

6)



$$Q = 34^\circ$$

$$\frac{\sin 107}{41} = \frac{\sin 39}{p}$$

$$\frac{\sin 107}{41} = \frac{\sin 34}{q}$$

$$p = 27$$

$$q = 24$$

7) In $\triangle XYZ$, $y = 24$ ft, $x = 28$ ft, $z = 22$ ft

$$m\angle X = 74.9^\circ, m\angle Y = 55.8^\circ, m\angle Z = 49.3^\circ$$

8) In $\triangle QRP$, $r = 14$ cm, $m\angle Q = 126.4^\circ$, $p = 24$ cm

$$m\angle R = 19.2^\circ, m\angle P = 34.4^\circ, q = 34.2$$
 cm

9) In $\triangle CAB$, $b = 9$ yd, $m\angle C = 123^\circ$, $a = 18$ yd

$$m\angle A = 38.7^\circ, m\angle B = 18.3^\circ, c = 24.1$$
 yd

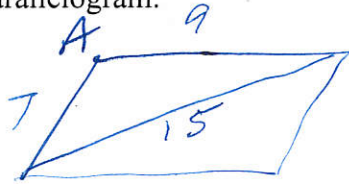
10) In $\triangle STR$, $t = 21$ m, $r = 17$ m, $m\angle S = 90^\circ$

$$m\angle T = 51^\circ, m\angle R = 39^\circ, s = 27$$
 m

11) In $\triangle PKH$, $k = 26$ cm, $h = 18$ cm, $p = 24$ cm

$$m\angle P = 63^\circ, m\angle K = 75^\circ, m\angle H = 42^\circ$$

- 12) 17) Two sides and a diagonal of a parallelogram are 7, 9, and 15 in respectively. Find the measures of the angles of the parallelogram.

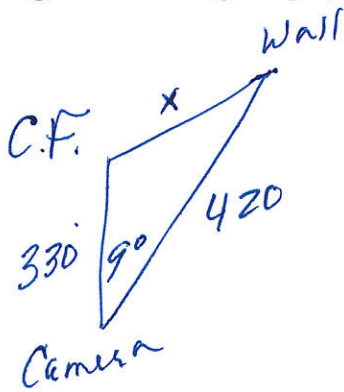


$$15^2 = 7^2 + 9^2 - 2(7)(9)\cos A$$

$$A \approx 139^\circ$$

$$139^\circ \text{ ; } 41^\circ$$

- 13) 18) A baseball player in center field is playing approximately 330 feet from the television camera that is behind home plate. A batter hit a fly ball that goes to the wall that is 420 feet from the camera. Approximate the number of feet the center fielder had to run to make the catch if the camera turned 9 degrees following the play.

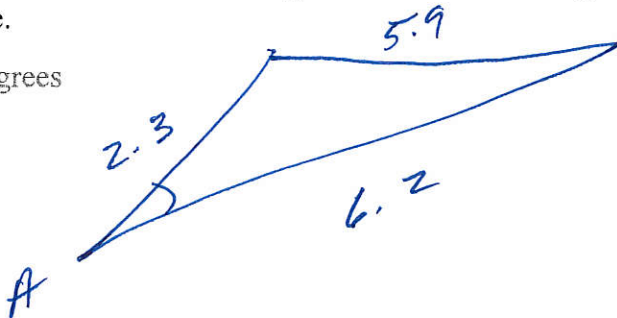


$$x^2 = 330^2 + 420^2 - 2(330)(420)\cos 9^\circ$$

$$x \approx 89 \text{ ft}$$

- 14) 19) A bicycle race follows a triangular course. The three legs of the course are in order, 2.3 km., 5.9 km. and 6.2 km. Find the angle between the starting leg and the finishing leg to the nearest degree.

72 degrees

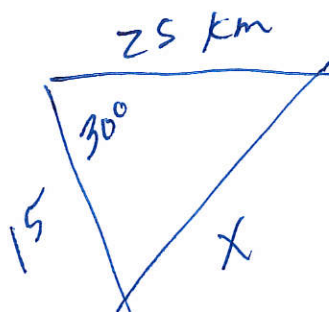


$$5.9^2 = 2.3^2 + 6.2^2 - 2(2.3)(6.2)\cos A$$

$$72^\circ$$

- 15) 20) A boat leaves Kingston and heads due east for 25 km. At the same time a second boat travels at a direction of 30° south of east from Kingston for 15 km. How far apart are the boats when they reach their destinations.

14.2 km



$$x^2 = 25^2 + 15^2 - 2(25)(15)\cos 30^\circ$$

$$x \approx 14.2 \text{ km}$$

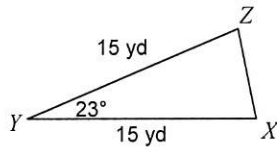
Find the area of each triangle to the nearest tenth.

$$A = \frac{1}{2}bc\sin A$$

$$s = \frac{1}{2}(a + b + c)$$

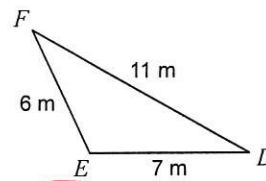
$$A = \sqrt{s(s-a)(s-b)(s-c)}$$

16)



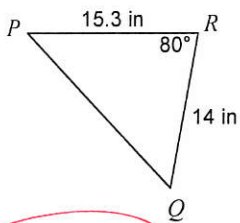
44 yd²

17)



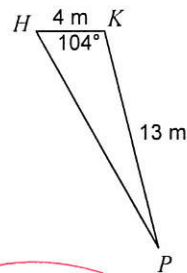
19 m²

18)



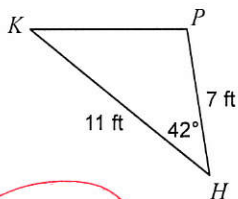
105.5 in²

19)



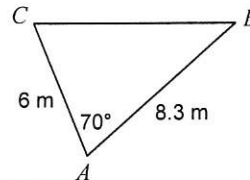
25.2 m²

20)



25.8 ft²

21)



23.4 m²