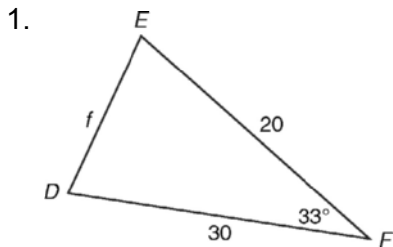


LESSON
13-6

Practice A
The Law of Cosines

Solve each triangle. Round to the nearest tenth.

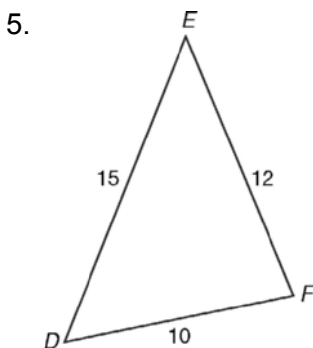
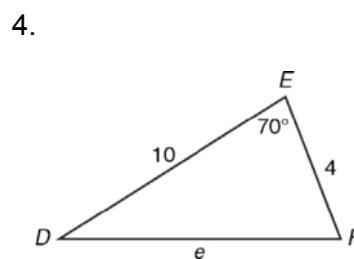
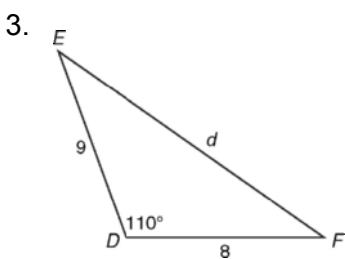
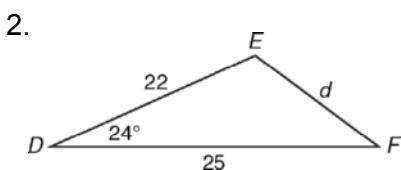


a. Substitute f for a , 20 for b , 30 for c , and 33° for A in the formula $a^2 = b^2 + c^2 - 2bccos A$.

b. Solve for the positive value of a . _____

c. Use the Law of Sines to find $m\angle E$.

d. Use the Triangle Sum Theorem to find $m\angle D$.

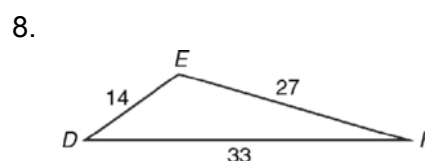
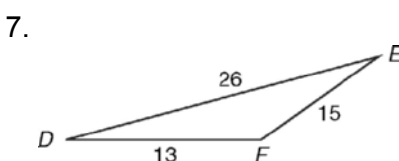
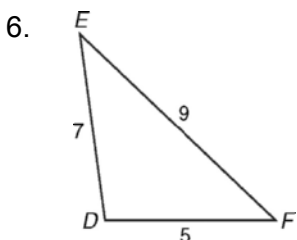


a. Substitute 12 for a , 15 for b , 10 for c , and D for A in the formula $a^2 = b^2 + c^2 - 2bccos A$.

b. Use your calculator to solve for $m\angle D$. _____

c. Use the Law of Sines to find $m\angle E$.

d. Use the Triangle Sum Theorem to find $m\angle F$.



Find the area using Heron's Formula, $Area = \sqrt{s(s-a)(s-b)(s-c)}$.

9. A triangle with side lengths of 14 meters, 19 meters, and 21 meters

10. A triangle with side lengths 7.5 miles, 11 miles, and 13 miles

the Law of Sines, $\frac{\sin A}{a} = \frac{\sin B}{b}$, and

$b = \frac{a \sin B}{\sin A}$. Substitute in the area formula:

$$\text{Area} = \frac{1}{2} \left(\frac{a \sin B}{\sin A} \right) (a \sin C) = \frac{a^2 \sin B \sin C}{2 \sin A}$$

Problem Solving

- $A = \frac{1}{2}(100)(53.2)\sin(40^\circ)$
 - 1709.8 yd²
- $221.6 - (100 + 53.2) = 68.4$ yd
 - $\frac{\sin S}{53.2} = \frac{\sin 40^\circ}{68.4}$; so $\angle S = 30^\circ$
 - Possible answer: $180^\circ - (30^\circ + 40^\circ) = 110^\circ$. Or, if student uses the Law of Sines, check the work.
- 45°
 - $\frac{40 \sin 80^\circ}{\sin 45^\circ} = 55.7$ yd
- B
- F

Reading Strategy

- Solve.
- Solve.
- No triangle
- 2 triangles
- Solve.
- No triangle

LESSON 13-6

Practice A

- $f^2 = 20^2 + 30^2 - 2(20)(30)\cos 33^\circ$
 - $f \approx 17.1$
 - $m\angle E \approx 72.5^\circ$
 - $m\angle D \approx 74.5^\circ$
- $d \approx 10.2$; $m\angle E \approx 94.7^\circ$; $m\angle F \approx 61.3^\circ$
- $d \approx 13.9$; $m\angle E \approx 32.6^\circ$; $m\angle F \approx 37.4^\circ$
- $e \approx 9.4$; $m\angle D \approx 23.5^\circ$; $m\angle F \approx 86.5^\circ$
- $12^2 = 15^2 + 10^2 - 2(15)(10)\cos D$
 - $m\angle D \approx 52.9^\circ$
 - $m\angle E \approx 41.6^\circ$
 - $m\angle F \approx 85.5^\circ$

- $m\angle D \approx 95.7^\circ$; $m\angle E \approx 33.6^\circ$; $m\angle F \approx 50.7^\circ$
- $m\angle D \approx 23.5^\circ$; $m\angle E \approx 20.2^\circ$; $m\angle F \approx 136.3^\circ$
- $m\angle D \approx 53^\circ$; $m\angle E \approx 102.5^\circ$; $m\angle F \approx 24.5^\circ$
- 129.8 m²
- 41.2 mi²

Practice B

- $m \approx 16.6$; $m\angle L \approx 28.7^\circ$; $m\angle N \approx 57.3^\circ$
- $n \approx 10.7$; $m\angle L \approx 134.5^\circ$; $m\angle M \approx 9.5^\circ$
- $m \approx 28.7$; $m\angle L \approx 65.9^\circ$; $m\angle N \approx 49.1^\circ$
- $m\angle L \approx 84.8^\circ$; $m\angle M \approx 55.1^\circ$; $m\angle N \approx 40.1^\circ$
- $l \approx 43.5$; $m\angle M \approx 25.4^\circ$; $m\angle N \approx 117.6^\circ$
- $m\angle L \approx 25.5^\circ$; $m\angle M \approx 26.9^\circ$; $m\angle N \approx 127.6^\circ$
- $m\angle L \approx 27.2^\circ$; $m\angle M \approx 101^\circ$; $m\angle N \approx 51.8^\circ$
- $m \approx 10.1$; $m\angle L \approx 44.7^\circ$; $m\angle N \approx 117.3^\circ$
- $m\angle L \approx 68^\circ$; $m\angle M \approx 59.4^\circ$; $m\angle N \approx 52.6^\circ$
- 30 min
- 94.1 ft²

Practice C

- $r \approx 13.3$; $m\angle S \approx 34.4^\circ$; $m\angle T \approx 102.6^\circ$
- $t \approx 13.5$; $m\angle R \approx 40.1^\circ$; $m\angle S \approx 61.9^\circ$
- $m\angle R \approx 127.2^\circ$; $m\angle S \approx 32.1^\circ$; $m\angle T \approx 20.7^\circ$
- $m\angle R \approx 47.7^\circ$; $m\angle S \approx 76.9^\circ$; $m\angle T \approx 55.4^\circ$
- $t \approx 12.4$; $m\angle R \approx 57.7^\circ$; $m\angle S \approx 84.3^\circ$
- $m\angle R \approx 32.8^\circ$; $m\angle S \approx 82.8^\circ$; $m\angle T \approx 64.4^\circ$
- $m\angle R \approx 57^\circ$; $m\angle S \approx 33.3^\circ$; $m\angle T \approx 89.7^\circ$
- $r \approx 34$; $m\angle S \approx 23.1^\circ$; $m\angle T \approx 49.1^\circ$
- $m\angle R \approx 51.4^\circ$; $m\angle S \approx 70.8^\circ$; $m\angle T \approx 57.8^\circ$
- 1 h 39 min
- 104.9 m²

Reteach

- 46°; 9; 7.
- $a = 6.5$
- $m\angle B \approx 83.9^\circ$
- $m\angle C \approx 49.1^\circ$
- 9; 12; 7.
- $s = 14$
- $A = 31\text{m}^2$

Challenge

- $c + e = a$, so $e = a - c$
- $\cos C = \frac{\text{adj.}}{\text{hyp.}} = \frac{d + b}{2a}$, so $2a \cos C = d + b$, and $2a \cos C - b = d$; the right side of the equation is the FOIL method.