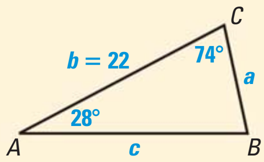
13 CHAPTER REVIEW

13.5 Apply the Law of Sines

pp. 882–888

EXAMPLE

Solve $\triangle ABC$ with $A = 28°$, $C = 74°$, and $b = 22$.



Find angle B: $B = 180° - 28° - 74° = 78°$.

Use the law of sines to solve for a and c.

$$\frac{a}{\sin 28°} = \frac{22}{\sin 78°} \qquad \frac{c}{\sin 74°} = \frac{22}{\sin 78°}$$

$$a = \frac{22 \sin 28°}{\sin 78°} \approx 10.6 \qquad c = \frac{22 \sin 74°}{\sin 78°} \approx 21.6$$

▸ For $\triangle ABC$, $B = 78°$, $a \approx 10.6$, and $c \approx 21.6$.

EXERCISES

EXAMPLES 1, 2, 3 and 4 on pp. 882–884 for Exs. 18–21

Solve $\triangle ABC$. (*Hint:* Some of the "triangles" may have no solution and some may have two solutions.)

18. $A = 43°$, $C = 83°$, $b = 12$

19. $B = 104°$, $b = 25$, $c = 18$

20. $C = 55°$, $a = 17$, $c = 15$

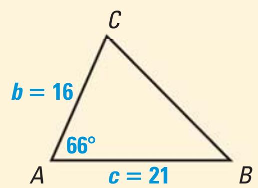
21. $B = 60°$, $C = 73°$, $b = 20$

13.6 Apply the Law of Cosines

pp. 889–894

EXAMPLE

Solve $\triangle ABC$ with $A = 66°$, $b = 16$, and $c = 21$.



Use the law of cosines to find the length a.

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$a^2 = 16^2 + 21^2 - 2(16)(21) \cos 66°$$

$$a^2 \approx 423.7$$

$$a \approx 20.6$$

Now find angle B and angle C.

$$\frac{\sin B}{16} = \frac{\sin 66°}{20.6}$$

$$\sin B = \frac{16 \sin 66°}{20.6} \approx 0.7095$$

$$B = \sin^{-1} 0.7095 \approx 45.2°$$

$$C \approx 180° - 66° - 45.2° \approx 68.8°$$

▸ For $\triangle ABC$, $B \approx 45.2°$, $C \approx 68.8°$, and $a \approx 20.6$.

EXERCISES

EXAMPLES 1 and 2 on pp. 889–890 for Exs. 22–24

Solve $\triangle ABC$.

22. $a = 19$, $b = 11$, $c = 14$

23. $B = 75°$, $a = 20$, $c = 17$

24. $a = 30$, $b = 35$, $c = 39$