8.1

THE AMBIGUOUS CASE (LAW OF SINES)

A Express lengths to one decimal place and angles to the nearest degree.

1 For each ΔABC, decide what type of solution you will obtain for $\angle B$.

(a) $a = 45, b = 75, \angle A = 76°$

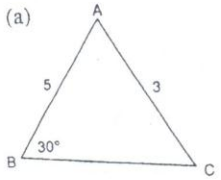
(b) $\angle A = 48°, a = 26, b = 22$

(c) $b = 576, a = 730, \angle A = 31°$

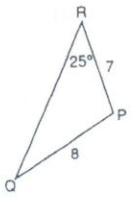
(d) $a = 15.6, b = 25.4, \angle A = 69°$

2 Is each sketch reasonable? Draw a better sketch for any that are unreasonable.

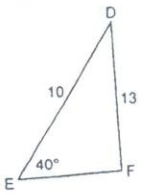
(a)



(b)



(c)



3 If $0° \leqq A \leqq 180°$, find two values for A for each.

(a) $\sin A = 0.7431$

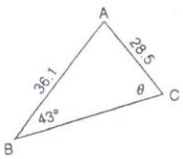
(b) $\sin A = 0.3907$

(c) $\sin A = 0.7169$

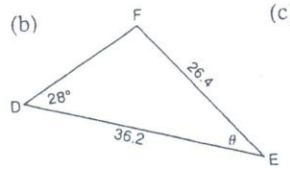
(d) $\sin A = 0.8686$

B 4 For each triangle, find the measure, or possible measures, of angle θ.

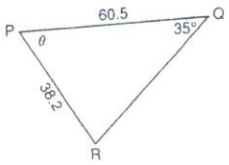
(a)



(b)



(c)



5 Solve each ΔABC.

(a) $a = 65.5, b = 78.4, \angle A = 51°$

(b) $b = 15, c = 55, \angle B = 75°$

(c) $b = 16.3, c = 18.2, \angle B = 54°$

(d) $b = 25.5, c = 22.5, \angle C = 62°$

6 Two forest fire stations, P and Q, are 20.0 km apart. A ranger at station Q sees a fire 15.0 km away. If the angle between the line PQ and the line from P to the fire is 21°, find how far station P is from the fire.

7 A marathon swimmer starts at Island A, swims 9.2 km to Island B and then 8.6 km to Island C. If $\angle BAC = 52°$, how far does she have to swim back to Island A?

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1. a) no solution **b)** 1 solution **c)** 1 solution **d)** no solution **2. a)** Yes, but another sketch is possible **b)** yes—1 solution **c)** yes—1 solution **3. a)** 48°, 132° **b)** 23°, 157° **c)** 46°, 134° **d)** 60°, 120° **4. a)** 60° or 120° **b)** 112°, 12° **c)** 30°, 80° **5. a)** (1) $\angle A = 51°, \angle B = 68°, \angle C = 61°, a = 65.5, b = 78.4, c = 73.7$ (2) $\angle A = 51°, \angle B = 112°, \angle C = 17°, a = 65.5, b = 78.4, c = 24.6$ **b)** no solution **c)** $\angle A = 28°, \angle B = 90°, \angle C = 62°, a = 12.0, b = 25.5, c = 22.5$ **d)** no solution **6.** 2 answers: 32.1 km or 5.8 km **7.** 2 answers: 10.3 km or 1.0 km **8.** 45.7 m