G.SRT.D.11: Law of Sines 3

1   In $\triangle ABC$, $m\angle A = 53$, $m\angle B = 14$, and $a = 10$. Find b to the nearest integer.

2   In $\triangle FUN$, $f = 4$, $m\angle F = 26$, and $m\angle N = 67$. Find the value of n to the *nearest integer*.

3   In $\triangle ABC$, $m\angle A = 30$, $m\angle B = 65$, and $BC = 10$. Find AC to the *nearest tenth*.

4   In $\triangle ABC$, $m\angle A = 35$, $m\angle B = 82$, and side $a = 4$ inches. Find the length of side b to the *nearest tenth of an inch*.

5   In $\triangle ABC$, $m\angle A = 35$, $m\angle C = 60$, and $AC = 12$ meters. Find the length of $\overline{BC}$ to the *nearest meter*.

6   The Vietnam Veterans Memorial in Washington, D.C., is made up of two walls, each 246.75 feet long, that meet at an angle of 125.2°. Find, to the *nearest foot*, the distance between the ends of the walls that do not meet.

7   In the accompanying diagram of $\triangle ABC$, $m\angle A = 30$, $m\angle C = 50$, and $AC = 13$.
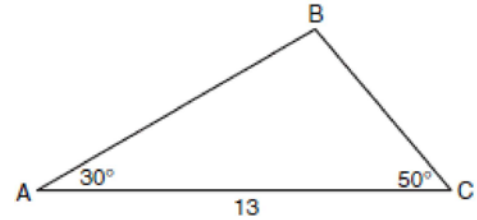

What is the length of side $\overline{AB}$ to the *nearest tenth*?
1)   6.6
2)   10.1
3)   11.5
4)   12.0

8   A ski lift begins at ground level 0.75 mile from the base of a mountain whose face has a 50° angle of elevation, as shown in the accompanying diagram. The ski lift ascends in a straight line at an angle of 20°. Find the length of the ski lift from the beginning of the ski lift to the top of the mountain, to the *nearest hundredth of a mile*.
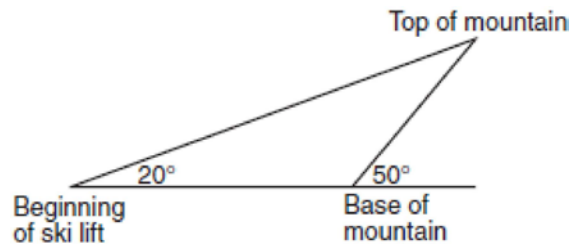
9   As shown in the accompanying diagram, two tracking stations, A and B, are on an east-west line 110 miles apart. A forest fire is located at F, on a bearing 42° northeast of station A and 15° northeast of station B. How far, to the *nearest mile*, is the fire from station A?
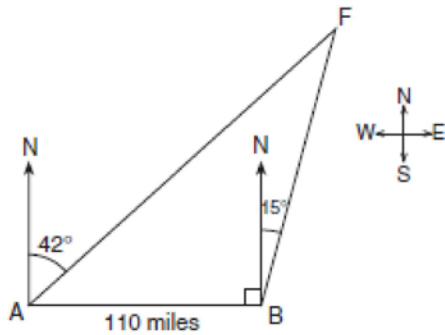
10   As shown in the diagram below, fire-tracking station A is 100 miles due west of fire-tracking station B. A forest fire is spotted at F, on a bearing 47° northeast of station A and 15° northeast of station B. Determine, to the *nearest tenth of a mile*, the distance the fire is from *both* station A and station B. [N represents due north.]
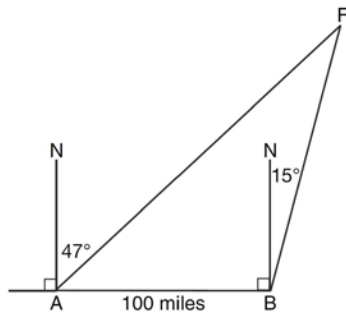
11   In $\triangle ABC$, $\sin A = 0.4293$, $\sin C = 0.4827$, and $a = 34.5$ centimeters. Find, to the *nearest tenth* of a centimeter, the measure of c.

12   In $\triangle ABC$, $m\angle A = 33$, $a = 12$, and $b = 15$. Find $\sin B$ to the *nearest thousandth*.

13   In $\triangle ABC$, $m\angle A = 33$, $a = 12$, and $b = 15$. What is $m\angle B$ to the *nearest degree*?
1)   41
2)   43
3)   44
4)   48

14   In triangle ABC, $a = 15$, $c = 20$, and $m\angle C = 100$. Find the measure of angle A to the *nearest degree*.

15   In acute triangle ABC, side $a = 10$, side $b = 12$, and $m\angle A = 42$. Find $m\angle B$ to the *nearest degree*.

16   In $\triangle ABC$, $m\angle A = 32$, $a = 12$, and $b = 10$. Find the measures of the missing angles and side of $\triangle ABC$. Round each measure to the *nearest tenth*.

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G.SRT.D.11: Law of Sines 3
Answer Section

1 ANS:

$$\frac{b}{\sin 14} = \frac{10}{\sin 53}$$

$$b = \frac{10 \sin 14}{\sin 53}$$

3. $b \approx 3$

REF: 060622b

2 ANS:
8

REF: 010109siii

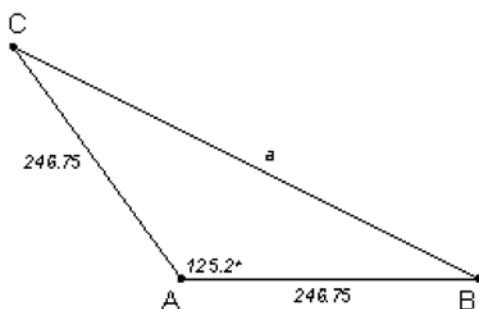3 ANS:
18.1

REF: 060211siii

4 ANS:
6.9

REF: 080304siii

5 ANS:
7

REF: 010205siii

6 ANS:

438.   Because this is an isosceles triangle, B and C are both 27.4°.

$$\frac{a}{\sin 125.2} = \frac{246.75}{\sin 27.4}$$

$$a = \frac{246.75 \sin 125.2}{\sin 27.4}$$

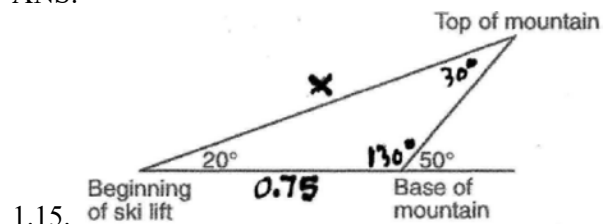$$a \approx 438$$

REF: 010631b

7 ANS: 2

$$\frac{c}{\sin 50} = \frac{13}{\sin 100}$$

$$x = \frac{13 \sin 50}{\sin 100}$$
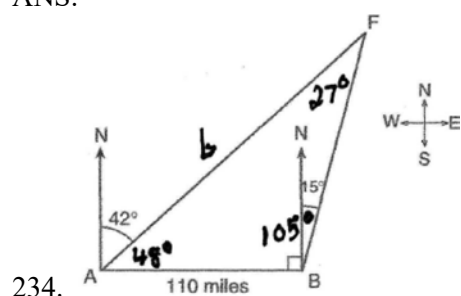
$$x \approx 10.1$$

REF: 080214b

8 ANS:

$$\frac{x}{\sin 130} = \frac{.75}{\sin 30}$$

$$x = \frac{.75 \sin 130}{\sin 30}$$

$$x \approx 1.15$$

1.15.

REF: 080421b

9 ANS:

$$\frac{b}{\sin 105} = \frac{110}{\sin 27}$$

$$b = \frac{110 \sin 105}{\sin 27}$$

$$b \approx 234$$

234.

REF: 060527b

10 ANS:

$$\frac{100}{\sin 32} = \frac{b}{\sin 105}. \quad \frac{100}{\sin 32} = \frac{a}{\sin 43}$$

$$b \approx 182.3 \qquad a \approx 128.7$$

REF: 011338a2

11 ANS:
38.8

REF: 019504siii

12 ANS:
0.681

REF: 019911siii

2

13 ANS: 2

$$\frac{15}{\sin B} = \frac{12}{\sin 33}$$

$$\sin B = \frac{15 \sin 33}{12}$$

$$B = \sin^{-1} \frac{15 \sin 33}{12}$$

$$B \approx 43°$$

REF: 010212b

14 ANS:
48

REF: 068442siii

15 ANS:
53

REF: 010313siii

16 ANS:

$$\frac{12}{\sin 32} = \frac{10}{\sin B} \qquad . \ C \approx 180 - (32 + 26.2) \approx 121.8. \quad \frac{12}{\sin 32} = \frac{c}{\sin 121.8}$$

$$B = \sin^{-1} \frac{10 \sin 32}{12} \approx 26.2 \qquad\qquad c = \frac{12 \sin 121.8}{\sin 32} \approx 19.2$$

REF: 011137a2