



- 4 A wooden frame is to be constructed in the form of an isosceles trapezoid, with diagonals acting as braces to strengthen the frame. The sides of the frame each measure 5.30 feet, and the longer base measures 12.70 feet. If the angles between the sides and the longer base each measure  $68.4^\circ$ , find the length of one brace to the *nearest tenth of a foot*.
- 5 A ship at sea is 70 miles from one radio transmitter and 130 miles from another. The angle between the signals sent to the ship by the transmitters is  $117.4^\circ$ . Find the distance between the two transmitters, to the *nearest mile*.
- 6 Main Street and Park Avenue intersect at an angle of  $74^\circ$ . Mr. Jones lives on Main Street, 50 meters from the intersection, and Mr. Smith lives on Park Avenue, 40 meters from the intersection. The triangle formed by the intersection and the houses is an acute triangle. Find, to the *nearest meter*, the distance between Mr. Jones' house and Mr. Smith's house.
- 7 The distance from  $A$  to  $C$  is 40 miles and the distance from  $C$  to  $B$  is 70 miles. If  $m\angle ACB = 110$ , find  $AB$  to the *nearest mile*.
- 8 The playground at a day-care center has a triangular-shaped sandbox. Two of the sides measure 20 feet and 14.5 feet and form an included angle of  $45$ . Find the length of the third side of the sandbox to the *nearest tenth of a foot*.
- 9 To measure the distance through a mountain for a proposed tunnel, surveyors chose points  $A$  and  $B$  at each end of the proposed tunnel and a point  $C$  near the mountain. They determined that  $AC = 3,800$  meters,  $BC = 2,900$  meters, and  $m\angle ACB = 110$ . Draw a diagram to illustrate this situation and find the length of the tunnel, to the *nearest meter*.
- 10 Two sides of a parallelogram measure 27 cm and 32 cm. The included angle measures  $48^\circ$ . Find the length of the longer diagonal of the parallelogram, to the *nearest centimeter*.

## G.SRT.D.11: Law of Cosines 3

## Answer Section

1 ANS: 3

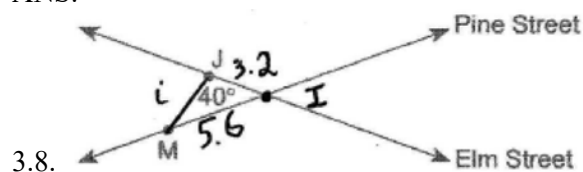
$$a^2 = 30^2 + 50^2 - 2(30)(50)\cos 120$$

$$a^2 = 4900$$

$$a = 70$$

REF: 060817b

2 ANS:



$$i^2 = j^2 + m^2 - 2jm\cos I$$

$$i^2 = 5.6^2 + 3.2^2 - 2(5.6)(3.2)\cos 40$$

$$i^2 \approx 14.1$$

$$i \approx 3.8$$

REF: 010227b

3 ANS:

$$a^2 = 1146.75^2 + 3746.75^2$$

4,506.

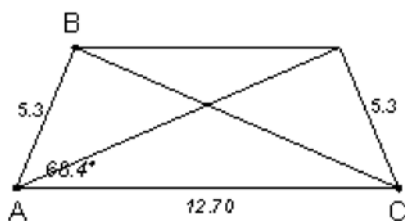
$$-2(1146.75)(3746.75)\cos 125.2$$

$$a^2 \approx 20306552.66$$

$$a \approx 4506$$

REF: fall9929b

4 ANS:



11.8.

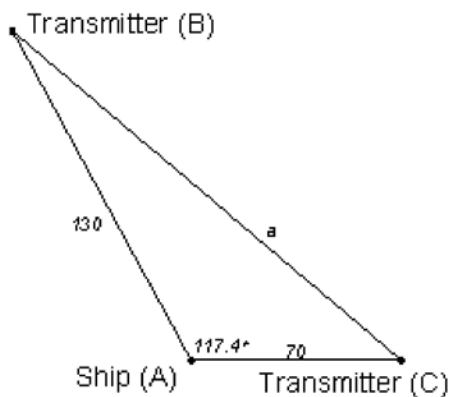
$$a^2 = 12.7^2 + 5.3^2 - 2(12.70)(5.3)\cos 68.4$$

$$a^2 \approx 139.8$$

$$a \approx 11.8$$

REF: 060127b

5 ANS:



174.

$$a^2 = 70^2 + 130^2 - 2(70)(130) \cos 117.4$$

$$a^2 \approx 30175.6$$

$$a \approx 174$$

REF: 080329b

6 ANS:

55

REF: 018540siii

7 ANS:

92

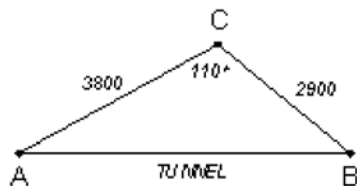
REF: 068938siii

8 ANS:

14.1

REF: 010240siii

9 ANS:



$$5,513. \quad c^2 = 2900^2 + 3800^2 - 2(2900)(3800) \cos 110$$

$$c \approx 5513$$

REF: 010528b

10 ANS:

$$\sqrt{27^2 + 32^2 - 2(27)(32) \cos 132} \approx 54$$

REF: 011438a2