

1. Two straight roads, Elm Street and Pine Street, intersect creating a 40° angle, as shown in the accompanying diagram. John's house (J) is on Elm Street and is 3.2 miles from the point of intersection. Mary's house (M) is on Pine Street and is 5.6 miles from the intersection. Find, to the *nearest tenth of a mile*, the direct distance between the two houses.



1.

2. Gregory wants to build a garden in the shape of an isosceles triangle with one of the congruent sides equal to 12 yards. If the area of his garden will be 55 square yards, find, to the *nearest tenth of a degree*, the *three* angles of the triangle.

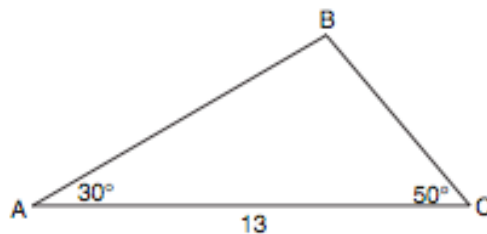
2.

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

What is the length of side \overline{AB} to the *nearest tenth*?

- (1) 12.0 (2) 6.6
(3) 10.1 (4) 11.5

SHOW ALL WORK.



3.

4. Find $\cos \frac{1}{2}y$ if $\cos y = 0.28$ and $270^\circ < y < 360^\circ$.

4.

5. If $\csc \theta = -\frac{2\sqrt{5}}{3}$ and $\cot \theta < 0$, find $\cos \theta$.

5.

6. Sketch the graph of $36(x-1)^2 + 9(y+2)^2 = 324$. (Do not use a calculator.)

