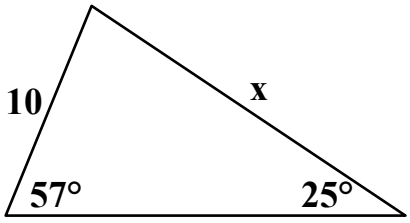
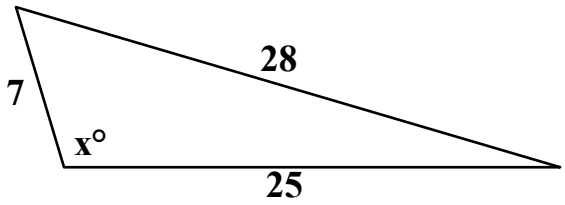
Precalculus Review Unit 6 page 1 _____

Solve for x. Express your solutions rounded to 3 significant digits. Show your work neatly organized. The diagrams are not drawn to scale.

1. x = _____



2. x = _____



Answer each of the following questions. Express your answers rounded to 3 significant digits.

3. What is the component form of the vector v if || v || = 15 and the direction angle θ_v = 347° ?

v = _____

4. What is the magnitude and the direction angle of the vector w = ⟨-6, 2.5⟩ ?

|| w || = _____ θ_w = _____

Solve each of the following problems. Express your solutions rounded to 3 significant digits.

5. A freighter leaves Boston Harbor at 9:00 AM sailing on a heading of N 78º E at a constant speed of 8 mph. At 10:00 AM, an ocean liner leaves Boston Harbor sailing on a heading of S 25º E at a constant speed of 12 mph. If both ships maintain their course and speed, then how far apart will they be at 1:00 PM?

6. Three forces with magnitudes of 50 pounds, 35 pounds and 20 pounds act on an object at angles of 70°, 120°, and 295° respectively (relative to the positive x-axis). What is the magnitude and the direction angle of the resultant force?

Perform the indicated operations. Express your answers using trigonometric form, exact values please.

7. $(3[\cos(5\pi/3) + i\sin(5\pi/3)])(2[\cos(\pi/5) + i\sin(\pi/5)]) =$ _____

8. $(6[\cos(11\pi/6) + i\sin(11\pi/6)]) \div (4[\cos(\pi/3) + i\sin(\pi/3)]) =$ _____

Find the indicated power of the given complex number. Express your answers in standard form, exact values please.

9. $(1 - \sqrt{3}\, i)^5 =$ _____

10. $(1 + i)^6 =$ _____

Find the indicated roots of the given complex number. Express all roots in standard form. Round to 3 significant digits.

11. Find all fourth roots of $-2\sqrt{2} + 2\sqrt{2}\,i$.

12. Find all cube roots of $3i$.