Simplify all answers and show your work!

1. The Pythagorean Theorem can only be used with ___________ triangles.

2. Using the terms “opposite”, “adjacent”, and “hypotenuse”, define the cos θ. __________________________

3. The cosecant of an angle θ (csc θ) is the reciprocal of what trigonometric function? ________________

4. There are ________ seconds in one minute.  
5. There are ________ seconds in one degree.

6. Convert 172° 25’ 36” to decimal notation.  
7. Convert 15.42° to degrees, minutes, and seconds.

Use the right triangle below to answer questions 8 – 14.

8. If a = 5 and b = 11, find c.  
9. If b = 12 and c = 21, find a.  
10. If b = 14 and c = 16, find sin B.

11. If m∠B = 36°, and c = 20, find a.  
12. If sin B = 4.675 and b = 7, find c.

13. If a = 8 and b = 15, find m∠A.  
14. If a = 3 and b = 4, find cos A.

Find the following.

15. tan 37.9°  
16. csc 152°  
17. cos 180°  
18. cot 0°

Solve for x.

19. sin 40° = \frac{5}{x}  
20. cot 120° = \frac{x}{9}  
21. sin A = 0.7956  
22. sec B = 4.5
23. How long would a ladder have to be to reach 10 feet up a wall if it were leaned against the wall with the ladder 4 feet away from the base of the house?

24. A 23-foot guy wire attaches the top of a 14-foot pole to the ground. How far from the base of the pole must the guy wire be attached to the ground for the wire to be taut?

25. Triangles IJK and TUV are similar. The lengths of the sides of ΔIJK are 203, 154, and 196. The length of the longest side of ΔTUV is 348, what is the perimeter of ΔTUV?

26. Examine the figure at the right. If BC is parallel to DE, answer the following. (Note: No angles are necessarily 90°, even though it may look like it.)

   a) \( \angle ABC \equiv \) ______________
   b) \( \angle DEC \equiv \) ______________

   c) What kind of triangles are ΔABC and ΔADE? ___________________
      (congruent, parallel, right, similar, or corresponding)

   d) If \( BC = 4 \), \( DE = 7 \), \( AD = 12 \), find \( AB \).

27. A flagpole casts a shadow 50 ft long at the same time that Gwen, who is 5.75 ft tall, casts a shadow 22 ft long. How tall is the flagpole?