Test 3 MAT 104 Summer 2008 Name_______________________

Simplify all answers and show your work!

1) The Pythagorean Theorem can only be used with **right** triangles.
2) In similar triangles, corresponding angles are **equal** and corresponding sides are **proportional**.
3) The Hypotenuse-Leg Theorem can only be used with **right** triangles.
4) The symbol ~ means **similar to**.
5) If \( \triangle ABC \sim \triangle DBE \) where \( AB = 8.3 \), \( BC = 8.1 \), \( AC = 6.2 \), and \( DE = 4.8 \), find the following.
   a) \( DB = 6.425 \)
   b) \( EB = 6.271 \)
   c) \( \angle ABC \equiv \angle DBE \)
   d) \( \angle BAC \equiv \angle BDE \)
   d) \( \angle BCA \equiv \angle BED \)

6) A building casts a shadow 36 m long. At the same time, the shadow cast by a 45-cm tall pole is 69 cm long. Find the height of the building. (Note: It doesn’t make any difference that these aren’t both in meters or centimeters.)

   23.5 m

7) Determine which theorem – if any – proves congruence for the given triangles: SSS, SAS, ASA, AAS, HL, or none.
   a) \( \angle 1 \equiv \angle 2 \), \( \triangle ABE \) is isosceles.
      Why is \( \triangle ACB \equiv \triangle ADE \)? (If it is.)
   b) \( \triangle \)
      ASA
      AAS
   c) \( \triangle \)
      SSS

Use the right triangle below to answer questions 7 – 12.

8) If \( a = 8 \) and \( c = 11 \), find \( \cos B \).

   \( \frac{8}{11} \)

9) If \( a = 7 \) and \( c = 25 \), find \( b \).

   \( b = 24 \)

10) If \( a = 7 \) and \( b = 5 \), find \( \sin A \).

    \( 0.8137 \)

11) If \( m\angle B = 51^\circ \) and \( a = 12 \), find \( c \).

    \( 19.1 \)

12) If \( m\angle A = 21^\circ \) and \( c = 8.1 \), find \( b \).

    \( 7.6 \)

13) If \( a = 3.4 \) and \( b = 5.2 \),
    a) find \( m\angle A \).
    b) find \( m\angle B \).

    \( 33.2^\circ \)
    \( 56.8^\circ \)
Find the values of the following.

13) \( \tan 38.35^\circ \)  \quad 14) \( \sin 86.3^\circ \)  \quad 15) \( \cos 25.9^\circ \)  \quad 16) \( \csc 57.68^\circ \)  \quad 17) \( \sec 73^\circ \)  

\( 0.7912 \)  \quad 0.9979  \quad 0.8996  \quad 1.1833  \quad 3.4203

Given the parallelogram to the right, answer the following questions.

18) If \( AB = 32.9 \) and \( BC = 59.6 \), find the following.
   a) \( CD = 32.9 \)  \quad b) \( AD = 59.6 \)  
   c) The perimeter of the parallelogram = 185

19) Given \( m\angle A = 75.6^\circ \), find the following.
   a) \( m\angle C = 75.6^\circ \)  \quad b) \( m\angle B = 104.4^\circ \)  \quad c) \( m\angle D = 104.4^\circ \)  

20) Given the triangle to the right, find the following.
   a) \( CB = 24 \)  \quad b) \( \sin A \)  \quad c) \( \cos A \)  \quad d) \( \tan A \)  
   e) \( \cot A \)  \quad f) \( \csc A \)  \quad g) \( \sec A \)  \quad h) \( m\angle A \)  \quad i) \( m\angle B \)  

21) A ladder is extended to a length of 28 feet long and the top is resting against the side of an apartment building. The base of the ladder is on the ground 4 feet from the base of the house. At what height does the ladder touch the apartment building wall?

   27.7 feet

22) A square park that is 250 ft by 250 ft has a brick pathway through the center on the diagonal. How many feet long is the brick pathway?

   353.6 feet

23) On a blueprint, four inches on the blueprint corresponds to 10 feet in real life. What are the dimensions of a rectangular room that measure 6 inches by 8.5 inches? (Hint: Proportions)

   15 feet by 21.25 feet (or 21 feet 3 inches)