Review Test 3
Chapters 5, 6, and 7

Study the following:

CHAPTER 5
- Know the following:
    o Similar triangles (5.2)
    o Triangle Proportionality Theorem (5.2)
    o Triangle Angle – Bisector Theorem (5.2)
    o Properties of right triangles (5.3)
    o The Phytagorean Theorem (5.4)
    o Special right triangles (5.4)
- Know the following formal proof:
    o Section 5.2 – Theorem 5.11
- Review the following homework problems:
    o All examples
    o Section 5.2 - # 19, 25, 31,33, 36, 37
    o Section 5.3 - # all assigned
    o Section 5.4 - #15, 19, 27, 31, 45, 47

CHPATER 6
- Handout Chapter 6
- Know the following formal proofs:
    o Section 6.2 – Theorem 6.6, theorem 6.7
    o Section 6.3 – Theorem 6.19
- Know the proofs of the following theorems (informal OK):
    o Section 6.2 – Theorem 6.13, theorem 6.15, theorem 6.20
- Review the following homework problems:
    o All examples
    o Sections 6.1, 6.2, 6.3 – all assigned

CHAPTER 7
- Review the following homework problems:
    o All examples
    o Sections 7.2 & 7.3 – all assigned

Review of the definitions, theorems, and properties learned. Answer the following questions. Make a drawing for each situation. Then translate the statements mathematically.

TRIANGLES

11. **The segment that joins the midpoints of two sides** of a triangle is _____ to the third side and its length is _____.

16. If **a line parallel to one side** of a triangle intersects the other two sides in different points, then:

   a) two _____ triangles are formed.

   b) The line divides the sides in _____.

17. When are two **triangles similar**?

18. What is the **Pythagorean theorem**? _____.

   The triangle must be _____.

19. What is the **converse of the Pythagorean theorem**? Is it true?

20. What do you know about the **altitude to the hypotenuse** in a right triangle?

   a) The altitude divides the right triangle into two _____ triangles. Each of these two triangle is also similar to _____.

   b) The altitude is the geometric mean of _____.

   c) One leg is the geometric mean of _____

21. In a right triangle, a leg opposes a 30 degree angle if and only if its length is _____ of the length of the _____.

22. The median from the right angle in a right triangle is _____.

23. In a triangle, the bisector of one angle divides the opposite side into segments that are_____

to the _____.

Answers: **TRIANGLES**

11. parallel; half of the third side   16. similar; equal ratios   17. AA   18. $a^2 + b^2 = c^2$, where a and b are legs, and c is hypotenuse; a right triangle   19. If $a^2 + b^2 = c^2$, then the triangle is right, with c = hypotenuse; yes   20a. similar ; the given triangle   20b. the segments formed on the hypotenuse 20c. the hypotenuse and the adjacent segment on the hypotenuse   21. half; hypotenuse   22. one-half the length of the hypotenuse

23. proportional; two sides that form the angle

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Answer true or false:

1) The hypotenuse is the side opposite one of the acute angles in a right triangle.   _____

3) A right isosceles triangle has two right angles.   _____

4) If three angles of one triangle are congruent with three angles of a second triangle, then the two triangles are congruent.   _____

5) Triangles can be proved congruent using SSA.   _____

6) Corresponding parts of congruent triangles are congruent.   _____

18) Two congruent triangles are also similar.   _____

19) Two similar triangles are also congruent.   _____

20) If two angles of one triangle are congruent to two angles of a second triangle, then the triangles are similar.   _____

21) If an acute angle of a right triangle is congruent to an acute angle of a second right triangle, then the two triangles are similar.   _____

22) A line through two sides of a triangle parallel to the third side divides the two sides proportionally.   _____

23) If the three sides of one triangle are parallel, respectively, to three sides of a second triangle, then the triangles are similar.   _____

24) Two right triangles are always similar triangles.   _____

25) The altitude to the hypotenuse of a right triangle forms two triangles that are similar._____

26) If the hypotenuse of an isosceles right triangle measures $8\sqrt{2}$ inches, then each leg is 8 inches long.   _____

27) The three sides of a right triangle could measure 9, 40, and 42 inches.   _____

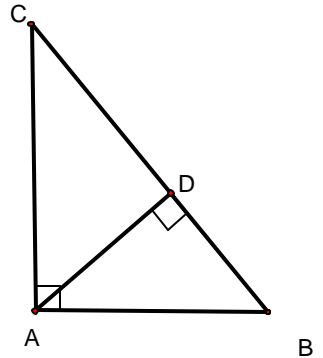(Answers: 1F, 3F, 4F, 5F, 6T, 18T, 19F, 20T, 21T, 22T, 23T, 24F, 25T, 26T, 27F)

1. a) Find the circumference of the given circle (exact answer).

    b) Find the area of the given circle.

    c) Find the length of the arc AB.
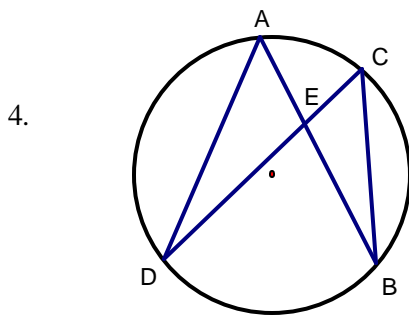
    d) Find the area of the sector AOB.

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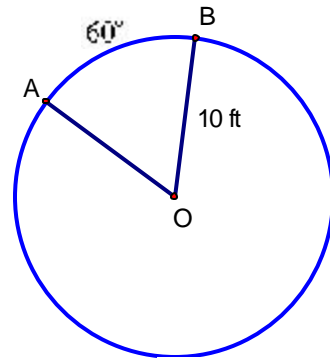
2. Triangle ABC is a right triangle with hypotenuse $BC = 15$ in and leg $AB = 9$ in.
   Find: a) BD
              b) CD
              c) AC
              d) AD
   Justify your answers.

3. a) Draw a right triangle with right angle C. Then draw the altitude $\overline{CD}$ and the median $\overline{CE}$.

    b) If $AB = c$, $AD = a$ and , find CE, CD and AC. Justify your answers.

4.

Given: DE = 9, EC = 4, EB= 7

Find: AB

5. Given: $\overrightarrow{AB}$ and $\overrightarrow{AC}$ are tangents to $\odot O$, with B and C on the circle and $m\angle ACB = 65°$.
              Find: a) $m\overarc{BC}$ b) $m\overarc{BDC}$ c) $m\angle ABC$ d) $m\angle A$

Answers

1. a) $20\boldsymbol{p}$ ft; b) $100\boldsymbol{p}$ sq. ft; c) $10\boldsymbol{p}/3$ ft; d) $50\boldsymbol{p}/3$ sq. ft
2. a) 27/5; b) 48/5; c) 12; d) 36/5
3. CE=c/2; CD= $\sqrt{a(c-a)}$; AC= $\sqrt{ac}$
4. 85/7