Overview Chapter 7 Special Right Triangles

1) What is Pythagorean theorem (in words)? In a right triangle, the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the legs.

2) What is the formula for Pythagorean theorem? \( A^2 + B^2 = C^2 \)

3) What do you look for when simplifying a radical? Perfect squares

4) What is a Pythagorean Triple? 3 numbers that when plugged into Pythagorean Theorem are true. Any multiple of those 3 numbers will also work in Pythagorean Theorem.

5) What are some common Pythagorean Triples? (3,4,5), (5,12,13), (7,24,25), (8,15,17)

6) What is the converse of the Pythagorean theorem? If the squares of the length of the longest side of a triangle is equal to the sum of the squares of the lengths of the other two sides, then the triangle is a right triangle.

7) How do you know if a Triangle is Acute, Obtuse, or Right by using Pythagorean theorem? Acute if \( A^2 + B^2 > C^2 \), Obtuse if \( A^2 + B^2 < C^2 \), Right if \( A^2 + B^2 = C^2 \)

8) Copy Diagram of concept summary from page 443.

9) What is an altitude of a triangle? A perpendicular segment from one vertex of a triangle to the opposite side or to a line containing the opposite side.

10) What does theorem 7.5 say? If the altitude is drawn to the hypotenuse of a right triangle, then the two triangles formed are similar to the original triangle and to each other.

11) Draw a diagram of theorem 7.5.

12) What is Geometric mean? \( \frac{a}{x} = \frac{x}{b} \) where x represents the Geometric mean of two numbers “a” and “b”.

13) What is Momma, Baby, Daddy? This is the 3 similar triangles created from the altitude to the hypotenuse of a right triangle.
14) What is the setup for Geometric mean of altitude theorem?

\[
\frac{\text{part of hypotenuse}}{\text{altitude}} = \frac{\text{altitude}}{\text{other part of hypotenuse}}
\]

15) Draw a diagram of the Geometric mean of altitude theorem.

16) What is the setup for Geometric mean of a Leg theorem?

\[
\frac{\text{hypotenuse}}{\text{leg}} = \frac{\text{same leg}}{\text{part of hypotenuse adjacent to leg}}
\]

17) Draw a diagram of the Geometric mean of a Leg theorem.

18) What are the rules for multiplying radicals? Radical times radicals and numbers times numbers. Make sure the answer is completely simplified when done.

19) What are the rules for dividing radicals? No radical in the denominator, all radicals reduced, and all fractions simplified.

20) What does rationalizing the denominator mean? It means to get the radical out of the denominator of a fraction.

21) What are the words for a 45-45-90 Triangle theorem? For a 45°-45°-90° right triangle the length of the legs is x, and the hypotenuse is \(\sqrt{2}\) times the length of one leg.

22) What is the ratio of a 45-45-90 Triangle? \(x : x : x\sqrt{2}\)

23) How do you find a leg in a 45-45-90 triangle if given the hypotenuse? Divide the hypotenuse by \(\sqrt{2}\).

24) How do you find the hypotenuse if given a leg in a 45-45-90 triangle? Multiply the leg by \(\sqrt{2}\).

25) What kind of figures use a 45-45-90 triangle? Squares and isosceles right triangles.

26) What are the words for a 30-60-90 Triangle theorem? For a 30°-60°-90° right triangle the length of the shortest leg is x, the hypotenuse is twice the length of the shortest leg and the longer leg is \(\sqrt{3}\) times the length of the shortest leg.
27) What is the ratio of a 30-60-90 triangle? \( x : x\sqrt{3} : 2x \)

28) How do you find the short leg if given the hypotenuse in a 30-60-90 triangle? Divide the hypotenuse by 2.

29) How do you find the long leg if given the hypotenuse in a 30-60-90 triangle? First find the short leg, then multiply the short leg by \( \sqrt{3} \).

30) How do you find the hypotenuse if given the short leg in a 30-60-90 triangle? Multiply the short leg by 2.

31) How do you find the hypotenuse if given the long leg in a 30-60-90 triangle? First find the short leg by dividing the long leg by \( \sqrt{3} \). Then multiply the short leg by 2.

32) How do you find the long leg if given the short leg of a 30-60-90 triangle? Multiply the short leg by \( \sqrt{3} \).

33) What kind of figure use 30-60-90 triangle? Equilateral Triangle or right triangles with a 30° angle.