Name: KEY

Common Core Geometry

Date: _____

Period: _____

Chapter 7 REVIEW

I. Radicals

1. Express $\sqrt{32}$ in simplest radical form

$\sqrt{16}\sqrt{2}$

$4\sqrt{2}$

2. Express $2\sqrt{45}$ in simplest radical form

$2\sqrt{9}\sqrt{5}$ $6\sqrt{5}$

$2 \cdot 3 \cdot \sqrt{5}$

3. Express $3\sqrt{250}$ in simplest radical form

$3\sqrt{25}\sqrt{10}$

$3 \cdot 5 \cdot \sqrt{10}$ $15\sqrt{10}$

4. Find the sum of $\sqrt{18}$ and $\sqrt{72}$

$\sqrt{9}\sqrt{2} + \sqrt{36}\sqrt{2}$

$3\sqrt{2} + 6\sqrt{2}$

$9\sqrt{2}$

5. Find the sum of $\sqrt{150}$ and $\sqrt{24}$

$\sqrt{25} \cdot \sqrt{6}$ $\sqrt{4}\sqrt{6}$

$5\sqrt{6} + 2\sqrt{6}$

$7\sqrt{6}$

6. Simplify $2\sqrt{50} - \sqrt{2}$

$2\sqrt{25}\sqrt{2}$

$2 \cdot 5\sqrt{2} - \sqrt{2}$

$10\sqrt{2} - \sqrt{2} = 9\sqrt{2}$

7. Simplify $\sqrt{75} - 3\sqrt{27}$

$25\sqrt{3} - 3\sqrt{9}\sqrt{3}$

$5\sqrt{3} - 9\sqrt{3}$

$-4\sqrt{3}$

8. Simplify $\sqrt{48} - 5\sqrt{27} + 2\sqrt{108}$

$\sqrt{16}\sqrt{3} - 5\sqrt{9}\sqrt{3} + 2\sqrt{36}\sqrt{3}$

$4\sqrt{3} - 15\sqrt{3} + 12\sqrt{3}$

$\sqrt{3}$

9. Express in simplest radical form $\sqrt{6} \cdot \sqrt{15}$

$\sqrt{90}$

$\sqrt{9}\sqrt{10}$

$3\sqrt{10}$

10. Express in simplest radical form $\sqrt{8} \cdot \sqrt{12}$

$\sqrt{96}$

$\sqrt{16}\sqrt{6}$

$4\sqrt{6}$

11. Express in simplest radical form $8\sqrt{12} \cdot 3\sqrt{24}$

$24\sqrt{288}$ $288\sqrt{2}$

$24\sqrt{144}\sqrt{2}$

$24 \cdot 12\sqrt{2}$

12. Simplify $\frac{6\sqrt{20}}{3\sqrt{5}}$

$2\sqrt{4}$

$2 \cdot 2 = 4$

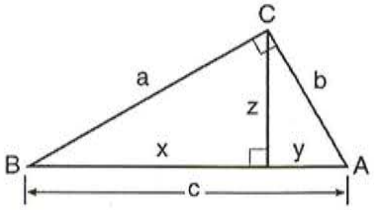
13. Simplify $\frac{\sqrt{84}}{2\sqrt{3}}$

$\frac{\sqrt{28}}{2} = \frac{\sqrt{4}\sqrt{7}}{2} = \frac{2\sqrt{7}}{2}$

$\sqrt{7}$

II. Right Triangles

14. In the diagram below of right triangle ABC, an altitude is drawn to the hypotenuse $\overline{AB}$. Which proportion would always represent a correct relationship of the segments?



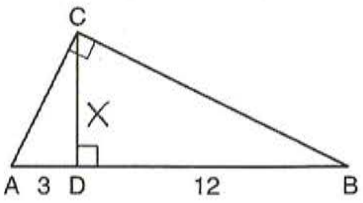
1) $\frac{c}{z} = \frac{z}{y}$ X

2) $\frac{c}{a} = \frac{a}{y}$ X

3) $\frac{x}{z} = \frac{z}{y}$ ✓

4) $\frac{y}{b} = \frac{b}{x}$ X

15. In the diagram below of right triangle ABC, altitude $\overline{CD}$ is drawn to hypotenuse $\overline{AB}$. If $AD = 3$ and $DB = 12$, what is the length of altitude $\overline{CD}$?

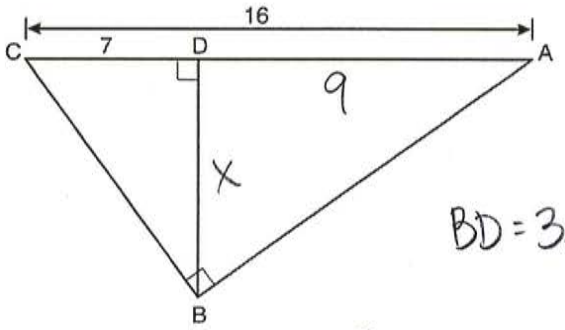


$\frac{3}{x} = \frac{x}{12}$ $CD = 6$

$x^2 = 36$

$x = 6$

16. In the diagram below of right triangle ABC, altitude $\overline{BD}$ is drawn to hypotenuse $\overline{AC}$, $AC = 16$, and $CD = 7$. What is the length of $\overline{BD}$?



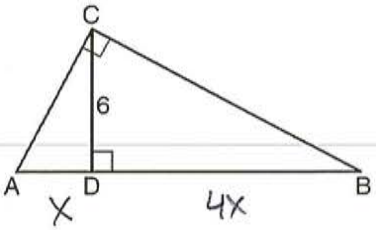
$BD = 3\sqrt{7}$

$\frac{x}{7} = \frac{9}{x}$

$x^2 = 63$

$x = 3\sqrt{7}$

17. In right triangle ABC below, $\overline{CD}$ is the altitude to hypotenuse $\overline{AB}$. If $CD = 6$ and the ratio of AD to AB is 1:5, determine and state the length of $\overline{BD}$. [Only an algebraic solution can receive full credit.]



$\overline{BD} = 12$

$\frac{6}{x} = \frac{4x}{6}$

$4x^2 = 36$

$x^2 = 9$

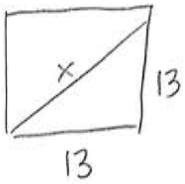
$x = 3$

22. The lengths of the sides of a right triangle can be

1) 9,12,15
2) 8,10,13
3) 5,5,10
4) 4,5,6

$a^2+b^2=c^2$

23. The length of one side of a square is 13 feet. What is the length, to the *nearest foot*, of a diagonal of the square?



$13^2+13^2=x^2$

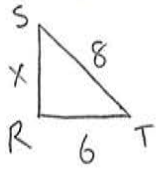
$169+169=x^2$

$338=x^2$

$x=18$ ft

24. In triangle *RST*, angle *R* is a right angle. If $TR=6$ and $TS=8$, what is the length of $\overline{RS}$?

1) 10
2) 2
3) $2\sqrt{7}$
4) $7\sqrt{2}$



$x^2+6^2=8^2$

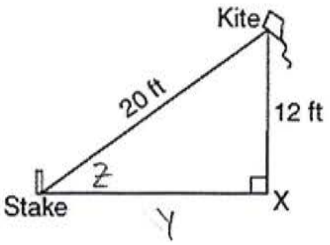
$x^2+36=64$

$x^2=28$

$x=\sqrt{28}$

$x=2\sqrt{7}$

25. The accompanying diagram shows a kite that has been secured to a stake in the ground with a 20-foot string. The kite is located 12 feet from the ground, directly over point X. What is the distance, in feet, between the stake and point X? What is the angle of elevation of the kite?



$y^2+12^2=20^2$

$y^2+144=400$

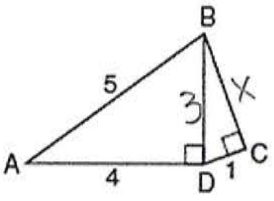
$y^2=256$

$y=16$ ft b/w stake and X

$\sin Z=\frac{12}{20}$

$Z=36.869898$ degrees

26. In the accompanying diagram of right triangles *ABD* and *DBC*, $AB=5$, $AD=4$, & $CD=1$. Find the length of $\overline{BC}$, to the *nearest tenth*.



$1^2+x^2=3^2$

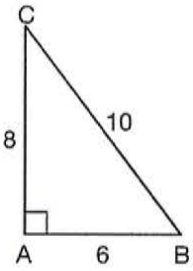
$1+x^2=9$

$x^2=8$

$x=\sqrt{8}$

$\overline{BC}=2.8$

27. In ΔABC below, the measure of $\angle A=90°$, $AB=6$, $AC=8$, and $BC=10$. Find the sine, cosine, and tangent of angle B.

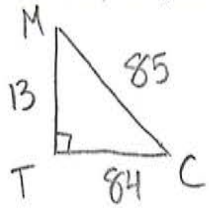


$\sin B=\frac{8}{10}$

$\cos B=\frac{6}{10}$

$\tan B=\frac{8}{6}$

28. In triangle *MCT*, the measure of $\angle T=90°$, $MC=85$ cm, $CT=84$ cm, and $TM=13$ cm. Find the sine, cosine, and tangent of angle C.

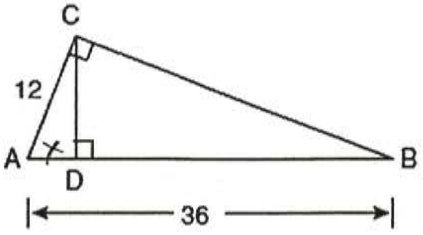


$\sin C=\frac{13}{85}$

$\cos C=\frac{84}{85}$

$\tan C=\frac{13}{84}$

18. In the diagram below of right triangle ACB, altitude $\overline{CD}$ is drawn to hypotenuse $\overline{AB}$. If $AB = 36$ and $AC = 12$, what is the length of $\overline{AD}$?



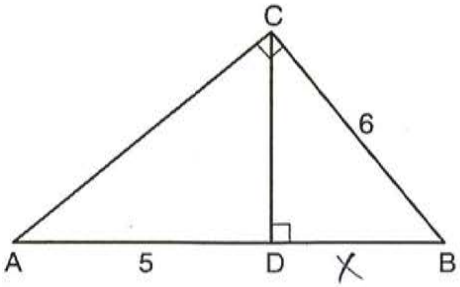
$\frac{12}{X} = \frac{36}{12}$

$\boxed{\overline{AD} = 4}$

$36X = 144$

$X = 4$

19. In the diagram below of right triangle ABC, $\overline{CD}$ is the altitude to hypotenuse $\overline{AB}$, $CB = 6$, and $AD = 5$. What is the length of $\overline{BD}$?



$\frac{6}{X} = \frac{X+5}{6}$

$X^2 + 5X = 36$

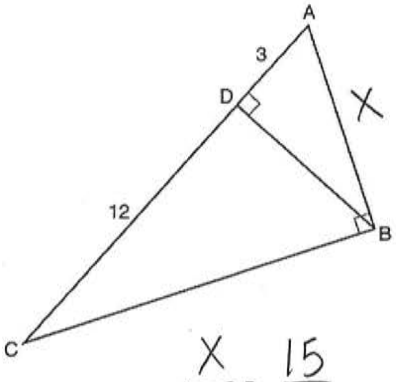
$X^2 + 5X - 36 = 0$

$(X+9)(X-4) = 0$

$-9 \mid 4$

$\boxed{\overline{BD} = 4}$

20. In right triangle ABC shown in the diagram below, altitude $\overline{BD}$ is drawn to hypotenuse $\overline{AC}$, $CD = 12$, and $AD = 3$. What is the length of $\overline{AB}$?



$\frac{X}{3} = \frac{15}{X}$

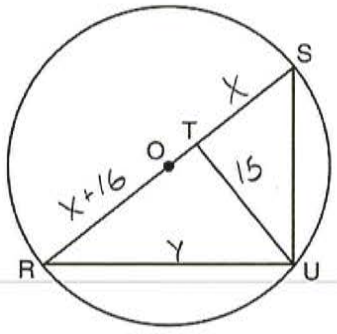
$\boxed{\overline{AB} = 3\sqrt{5}}$

$X^2 = 45$

$X = \sqrt{45}$

$X = 3\sqrt{5}$

21. In the diagram below, right triangle RSU is inscribed in circle O, and $\overline{UT}$ is the altitude drawn to hypotenuse $\overline{RS}$. The length of $\overline{RT}$ is 16 more than the length of $\overline{TS}$ and $TU = 15$. Find the length of $\overline{TS}$. Find, in simplest radical form, the length of $\overline{RU}$.



$\frac{15}{X} = \frac{X+16}{15}$

$X^2 + 16X = 225$

$X^2 + 16X - 225 = 0$

$(X+25)(X-9) = 0$

$-25 \mid 9$

$\overline{TS} = 9$

$25^2 + 15^2 = Y^2$

$625 + 225 = Y^2$

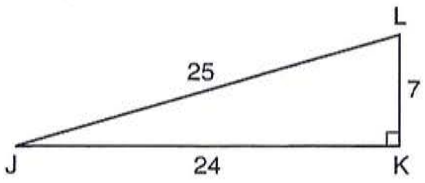
$850 = Y^2$

$\sqrt{25}\sqrt{34} = Y^2$

$5\sqrt{34} = Y$

$\overline{RU} = 5\sqrt{34}$

29. In right triangle JKL in the diagram below, $KL = 7$, $JK = 24$, $JL = 25$, and $\angle K = 90°$. Which statement is *not* true?



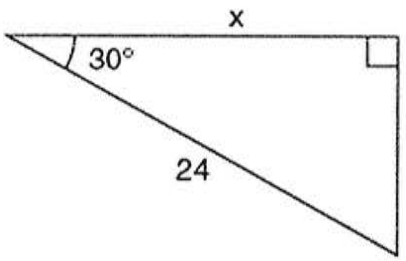
1) $\tan L = \frac{24}{7}$ ✓

2) $\cos L = \frac{24}{25}$

3) $\tan J = \frac{7}{24}$ ✓

4) $\sin J = \frac{7}{25}$ ✓

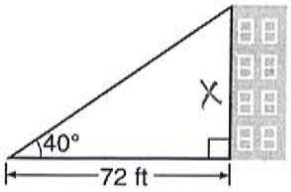
30. In the right triangle shown in the diagram below, what is the value of x to the *nearest whole number*?



$\cos 30 = \frac{x}{24}$

$x = 21$

31. As shown in the diagram below, a building casts a 72-foot shadow on the ground when the angle of elevation of the Sun is 40°. How tall is the building, to the *nearest foot*?



☼ $\tan 40 = \frac{x}{72}$

$x = 60$ ft

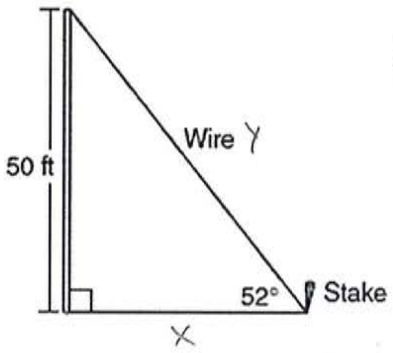
32. A right triangle contains a 38° angle whose opposite side measures 10 centimeters. What is the length of the hypotenuse, to the *nearest hundredth of a centimeter*?

$\sin 38 = \frac{10}{x}$

$x = \frac{10}{\sin 38}$

$x = 16.24$ cm = HYP

33. A stake is to be driven into the ground away from the base of a 50-foot pole, as shown in the diagram below. A wire from the stake on the ground to the top of the pole is to be installed at an angle of elevation of 52°. **How far away from the base of the pole should the stake be driven in, to the *nearest foot*?** What will be the length of the wire from the stake to the top of the pole, to the *nearest foot*?



$\tan 52 = \frac{50}{x}$

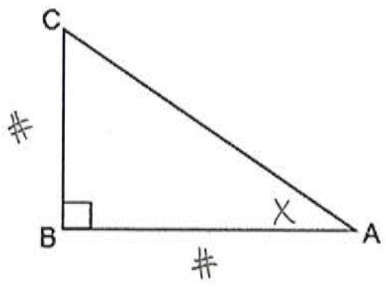
$x = \frac{50}{\tan 52}$

$x = 39$ ft

$\sin 52 = \frac{50}{y}$

$y = \frac{50}{\sin 52}$ $y = 63$ ft

34. Cassandra is calculating the measure of angle A in right triangle ABC, as shown in the accompanying diagram. She knows the lengths of $\overline{AB}$ and $\overline{BC}$. If she finds the measure of angle A by solving only one equation, which concept will be used in her calculations?

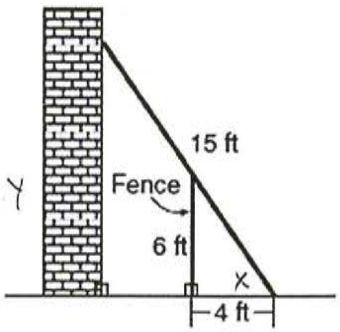


tangent

35. In the accompanying diagram, the base of a 15-foot ladder rests on the ground 4 feet from a 6-foot fence.

a If the ladder touches the top of the fence and the side of a building, what angle, to the *nearest degree*, does the ladder make with the ground?

b Using the angle found in part *a*, determine how far the top of the ladder reaches up the side of the building, to the *nearest foot*.



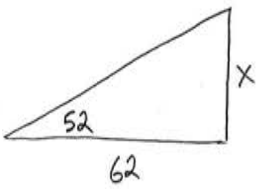
$\tan X = \frac{6}{4}$

$X = 56°$

$\sin 56 = \frac{Y}{15}$

$Y = 12$ ft

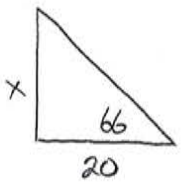
36. A person measures the angle of depression from the top of a wall to a point on the ground. The point is located on level ground 62 feet from the base of the wall and the angle of depression is 52°. How high is the wall, to the nearest tenth of a foot?



$\tan 52 = \frac{X}{62}$

$X = 79.4$ ft

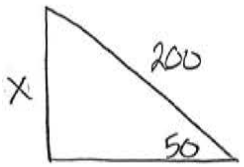
37. A tree casts a shadow that is 20 feet long. The angle of elevation from the end of the shadow to the top of the tree is 66°. Determine the height of the tree, to the *nearest foot*.



$\tan 66 = \frac{X}{20}$

$X = 45$ ft

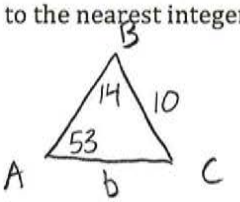
38. A ship on the ocean surface detects a sunken ship on the ocean floor at an angle of depression of 50°. The distance between the ship on the surface and the sunken ship on the ocean floor is 200 meters. If the ocean floor is level in this area, how far above the ocean floor, to the *nearest meter*, is the ship on the surface?



$\sin 50 = \frac{X}{200}$

$X = 153$ m

39. In ΔABC, $m\angle A = 53$, $m\angle B = 14$, and $a = 10$. Find b to the nearest integer.

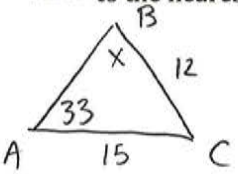


$\frac{\sin 53}{10} = \frac{\sin 14}{b}$

$\frac{b \cdot \sin 53}{\sin 53} = \frac{10 \cdot \sin 14}{\sin 53}$

$b = 3$

40. In ΔABC, $m\angle A = 33$, $a = 12$, and $b = 15$. What is $m\angle B$ to the *nearest degree*?



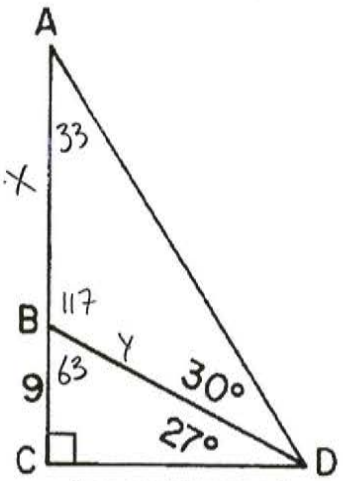
$\frac{\sin 33}{12} = \frac{\sin B}{15}$

$\frac{12 \cdot \sin B}{12} = \frac{15 \cdot \sin 33}{12}$

$\sin B = .6807987$

$B = 43°$

41. In the accompanying diagram of a right triangle ACD, B lies on $\overline{AC}$, $\overline{BD}$ is drawn such that $m\angle CDB = 27$, $m\angle BDA = 30$, and $BC = 9$. Find AB to the *nearest tenth*.



$\frac{\sin 27}{9} = \frac{\sin 90}{Y}$

$\frac{Y \cdot \sin 27}{\sin 27} = \frac{9 \cdot \sin 90}{\sin 27}$

$Y = 19.824203$

$\frac{\sin 33}{Y} = \frac{\sin 30}{X}$

$\frac{X \cdot \sin 33}{\sin 33} = \frac{Y \cdot \sin 30}{\sin 33}$

$AB = 18.2$