Geometry A
Unit 6 Assessment Review

Name: Key
Date: _____ Period: _____

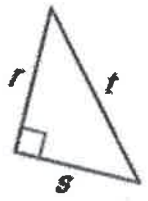
Chapter 7 Section 1 (Pythagorean Theorem):

I can...

- ✓ Use Pythagorean Theorem to find length of a leg or hypotenuse
- ✓ Use Pythagorean Theorem to solve real world problems
- ✓ Use Pythagorean Theorem to find area of an isosceles triangle

1. Which equation is ***not*** correct?

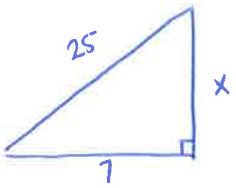
A) $t^2 - r^2 = s^2$
B) $t^2 + r^2 = s^2$
C) $s^2 - t^2 = -r^2$
D) $t^2 - s^2 = r^2$



$t^2 = r^2 + s^2$
$t^2 - r^2 = s^2$
$-r^2 = s^2 - t^2$
$t^2 - s^2 = r^2$

2. A 25-foot ladder leans against a wall 7 feet from the base of the wall. How high up the wall does the ladder touch?

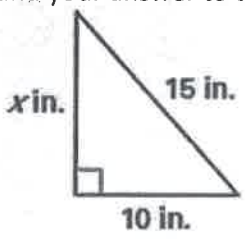
A) 24 ft
B) 18 ft
C) 20 ft
D) 21.5 ft



$7^2 + x^2 = 25^2$
$49 + x^2 = 625$
$\sqrt{x^2} = \sqrt{576}$
$x = 24$

3. What is the value of *x*? Round your answer to the nearest tenth.

A) 11.0
B) 11.1
C) 11.2
D) 18.0
E) 18.1



$x^2 + 10^2 = 15^2$
$x^2 + 100 = 225$
$\sqrt{x^2} = \sqrt{125}$
$x = 11.2$

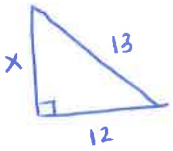
4. What is the area of the isosceles triangle to the nearest square meter?

A) 30 m^2
B) 60 m^2
C) 120 m^2
D) 156 m^2
E) 242 m^2

use whole base in Area formula

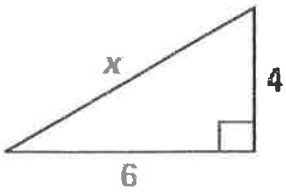
$\text{Area} = \frac{(\text{base})(\text{height})}{2}$
$= \frac{(24)(5)}{2}$
$= 60$

⇒



$x^2 + 12^2 = 13^2$
$x^2 + 144 = 169$
$\sqrt{x^2} = \sqrt{25}$
$x = 5$

5. Find the value of x. Leave your answer in simplest radical form.



$4^2+6^2=x^2$

$\sqrt{52}=\sqrt{x^2}$

$x=\sqrt{52}$

$x=\sqrt{4}\sqrt{13}$

$x=2\sqrt{13}$

or

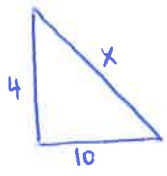
52

$2\cdot 26$

$2\cdot 2\sqrt{13}$

$2\sqrt{13}$

6. A right triangle has side lengths of 4 and 10. What are possible values for the missing side? Round to the nearest tenth. State whether the side is a hypotenuse or a leg.

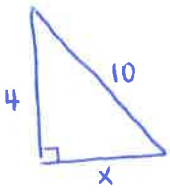


$4^2+10^2=x^2$

$\sqrt{116}=\sqrt{x^2}$

$x=10.8$ hyp.

OR



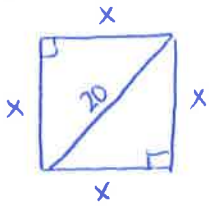
$x^2+4^2=10^2$

$x^2+16=100$

$\sqrt{x^2}=\sqrt{84}$

$x=9.2$ leg

7. The diagonal of a square is 20 m long. Please find the perimeter of the square. Round to the nearest tenth.



$x^2+x^2=20^2$

$\frac{2x^2}{2}=\frac{400}{2}$

$\sqrt{x^2}=\sqrt{200}$

$x=14.1$

Perimeter $=14.1+14.1+14.1+14.1$

$P=56.4\text{m}$

Chapter 7 Section 2 (Converse of Pythagorean Theorem)

I can...

- ✓ Determine if three segment lengths can form a triangle.
- ✓ Use the converse to determine if the triangle is right, acute or obtuse.

8. Which side lengths form an obtuse triangle? $c^2>a^2+b^2$

(A) 2, 5, 8 $\quad 8^2 \_ 2^2+5^2 \Rightarrow 64 \geq 29$

B) 4, 5, 6

C) 17, 18, 19

D) 21, 72, 75

E) 25, 45, 51

9. If the square of the length of the longest side of a triangle is greater than the sum of the squares of the lengths of the other two sides, then the triangle is_____.

$c^2 \quad > \quad a^2+b^2$

A) Equilateral

B) A right triangle

C) An acute triangle

(D) An obtuse triangle

10. What type of triangle has side lengths of 10, 28, and 29?

a b c

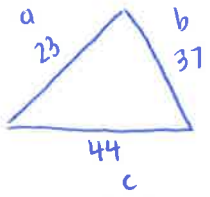
A) Acute
B) Obtuse
C) Right
D) Not a triangle

$c^2 \_ a^2 + b^2$

$29^2 \_ 10^2 + 28^2$

$841 < 884$

11. A biker traveled 23 miles in one direction and then 37 miles in another direction. He then headed 44 miles back to his original location. What type of triangle was formed by the path of his entire trip?



$c^2 \_ a^2 + b^2$

$44^2 \_ 23^2 + 37^2$

$1936 > 1898$

Obtuse Δ

because $c^2 > a^2 + b^2$

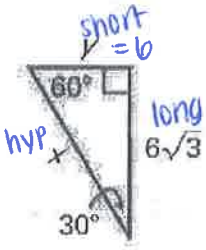
Chapter 7 Section 4 (Special Right Triangles)

I can...

- ✓ Use the 45°-45°-90° Triangle theorem to find side lengths
- ✓ Use the 30°-60°-90° Triangle theorem to find side lengths
- ✓ Use the 30°-60°-90° Triangle theorem to find side lengths and then find perimeter or area of an equilateral triangle.

12. Find the values of x and y.

A) x = 6 , y = 12
B) x = 12 , y = 6
C) $x = 12\sqrt{3}$, y = 6
D) $x = 8\sqrt{3}$, y = 8



long = short · √3

$\frac{6\sqrt{3}}{\sqrt{3}} = \frac{y\sqrt{3}}{\sqrt{3}}$

y = 6

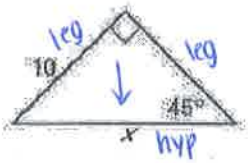
hyp = short · 2

x = 6 · 2

x = 12

For questions #12 – 17, find the value of each variable. Write your answers in simplest radical form.

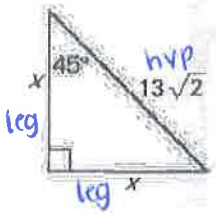
13.



hyp = leg · √2

$x = 10\sqrt{2}$

14.

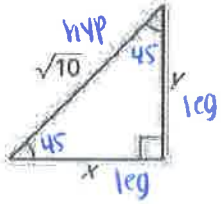


hyp = leg · √2

$\frac{13\sqrt{2}}{\sqrt{2}} = \frac{x\sqrt{2}}{\sqrt{2}}$

x = 13

15.



hyp = leg · √2

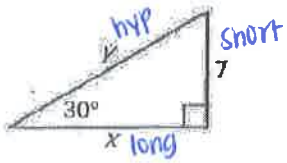
$\frac{\sqrt{10}}{\sqrt{2}} = \frac{x\sqrt{2}}{\sqrt{2}}$

$x = \frac{\sqrt{10}}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{20}}{2} = \frac{\sqrt{4}\sqrt{5}}{2} = \frac{2\sqrt{5}}{2}$

$y = \sqrt{5}$

$x = \sqrt{5}$

16.



hyp = short · 2

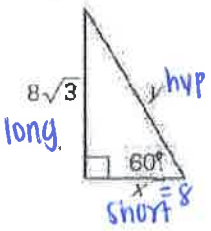
y = 7 · 2

y = 14

long = short · √3

$x = 7\sqrt{3}$

17.



long = short · $\sqrt{3}$

$\frac{8\sqrt{3}}{\sqrt{3}} = \frac{x\sqrt{3}}{\sqrt{3}}$

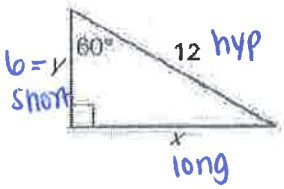
$x = 8$

hyp = short · 2

$y = 8 \cdot 2$

$y = 16$

18.



hyp = short · 2

$\frac{12}{2} = \frac{y \cdot 2}{2}$

$y = 6$

long = short · $\sqrt{3}$

$x = 6\sqrt{3}$

Chapter 7 Sections 5 and 6 (Trigonometric Ratios – SOHCAHTOA)

I can...

- ✓ Use sine, cosine, and tangent ratios to find side lengths in right triangles (SOHCAHTOA)
- ✓ Solve real world problems using SOHCAHTOA (using angles of elevation and depression)

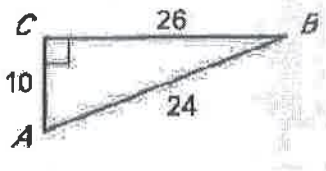
19. Find tan *A* and tan *B*.

A) tan *A* ≈ 0.38 , tan *B* ≈ 2.6

B) tan *A* = 2.6 , tan *B* ≈ 0.38

C) tan *A* ≈ 1.08 , tan *B* ≈ 0.42

D) tan *A* ≈ 0.92 , tan *B* = 2.4



$\tan A = \frac{26}{10} = 2.6$

$\tan B = \frac{10}{26} = 0.3846$

20. Which expression could be used to find the value of *x* in the diagram?

A) $\cos 55° = \frac{12}{x}$

B) $\cos 35° = \frac{x}{12}$

C) $\cos 35° = \frac{12}{x}$

D) $\cos 55° = \frac{x}{12}$

$\cos 55 = \frac{12}{x}$

21. What are the values of a and b? Please round to the nearest tenth.

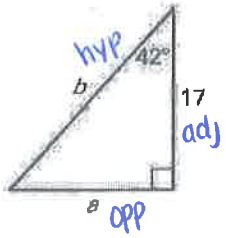
A) a = 11.4 , b = 12.6

B) a = 15.3 , b = 22.9

C) a = 12.6 , b = 15.3

D) a = 18.8 , b = 16.4

E) a = 25.4 , b = 25.4



$\frac{\cos 42}{1} = \frac{17}{b}$

$\frac{17 = b\cos 42}{\cos 42 \quad \cos 42}$

$b = 22.9$

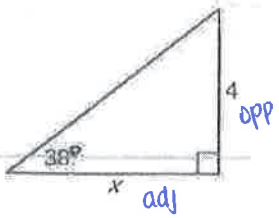
$\frac{\tan 42}{1} = \frac{a}{17}$

$a = 17 \tan 42$

$a = 15.3$

For questions #21 – 22, please find the value of x. Round to the nearest tenth.

22.



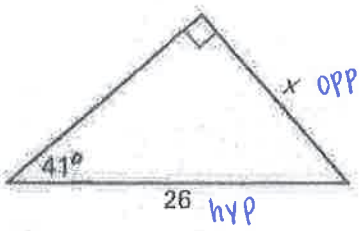
$\frac{\tan 38}{1} = \frac{4}{x}$

$4 = x \tan 38$

$x = \frac{4}{\tan 38}$

$x = 5.1$

23.



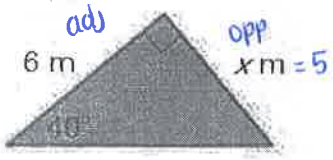
$\frac{\sin 41}{1} = \frac{x}{26}$

$x = 26 \sin 41$

$x = 17.1$

24. Find the approximate area of the triangle.

A) 15.1 m^2
B) 5.03 m^2
C) 45.3 m^2
D) 30.2 m^2



$\frac{\tan 40^\circ}{1} = \frac{x}{6}$

$x = 6 \tan 40^\circ$

$x = 5$

$A = \frac{(\text{base} \times \text{height})}{2}$

$= \frac{(5)(6)}{2}$

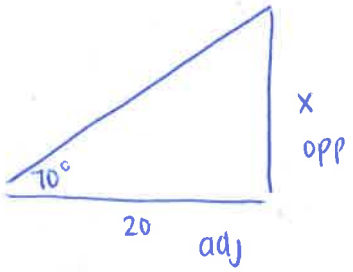
$A = 15$

25. The shadow of a telephone pole is 20 feet long. You measure the angle of elevation from the end of the shadow to the top of the telephone pole to be 70°. What is the height of the telephone pole? Round your answer to the nearest foot.

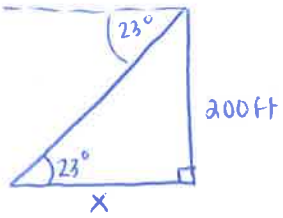
$\frac{\tan 70}{1} = \frac{x}{20}$

$x = 20 \tan 70$

$x = 54.9 \text{ ft} \approx 55 \text{ ft}$



26. From the top of a 200 foot lighthouse, the angle of depression to a ship in the ocean is 23°. How far is the ship from the base of the lighthouse?

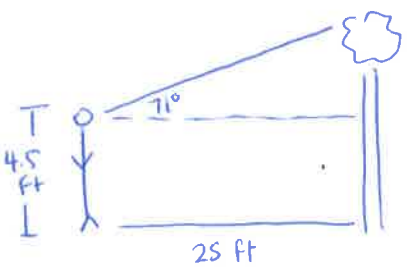


$\frac{\tan 23}{1} = \frac{200}{x}$

$\frac{200}{\tan 23} = \frac{x \tan 23}{\tan 23}$

$x = 471.2 \text{ ft}$

27. A hiker whose eyes are 4.5 feet above ground stands 25 feet from the base of a redwood tree. She looks up at an angle of 71° to see the top of the tree. What is the height of the tree? Please round to the nearest tenth of a foot.



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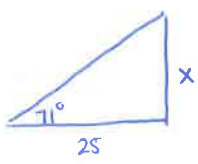


$\frac{\tan 71}{1} = \frac{x}{25}$

$x = 25 \tan 71 = 72.6$

height of tree =

$= 72.6 + 4.5$

$= 77.1 \text{ ft}$

Chapter 7 Section 7 (Solving Right Triangles)

I can...

- ✓ Use inverse trigonometric functions to find angle measurements in right triangles
- ✓ Solve right triangles

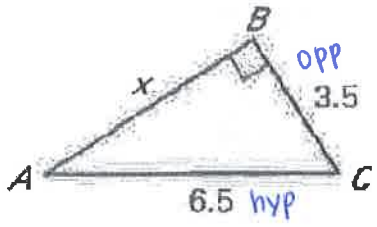
28. Please find m∠A.

A) 28.3°

B) 32.58°

C) 57.42°

D) 45°



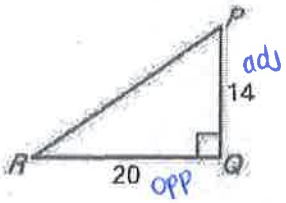
$\sin A = \frac{3.5}{6.5}$

$m\angle A = \sin^{-1}(3.5/6.5)$

$m\angle A = 32.6°$

For questions #26 – 28, please find the measure of ∠P to the nearest tenth of a degree.

29.

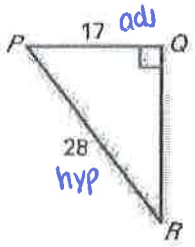


$\tan P = \frac{20}{14}$

$m\angle P = \tan^{-1}(20/14)$

$m\angle P = 55°$

30.

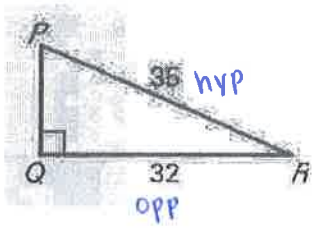


$\cos P = \frac{17}{28}$

$m\angle P = \cos^{-1}(17/28)$

$m\angle P = 52.6°$

31.



$\sin P = \frac{32}{35}$

$m\angle P = \sin^{-1}(32/35)$

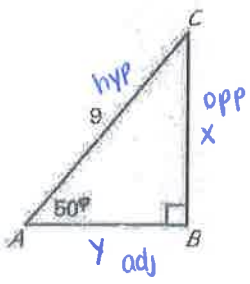
$m\angle P = 66.1°$

For questions #30 – 31, please solve the right triangle. Round decimal answers to the nearest tenth.

32.

$m\angle C = 180 - 90 - 50$

$m\angle C = 40°$



$BC = 6.9$

$AB = 5.8$

$\frac{\sin 50}{1} = \frac{x}{9}$

$x = 9 \cdot \sin 50$

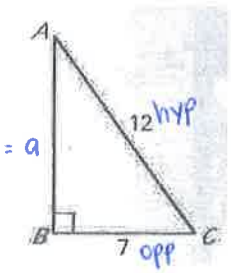
$x = 6.9$

$\frac{\cos 50}{1} = \frac{y}{9}$

$y = 9 \cos 50$

$y = 5.8$

33.



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

$a^2 + 7^2 = 12^2$

$a^2 + 49 = 144$

$a^2 = 95$

$a = 9.7$

$AB = 9.7$

$\sin A = \frac{7}{12}$

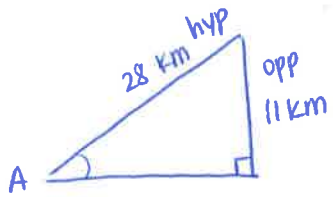
$m\angle A = \sin^{-1}(7/12)$

$m\angle A = 35.7°$

$m\angle C = 180 - 90 - 35.7$

$m\angle C = 54.3°$

34. Robbie drives 28 km up a hill, which puts him at an altitude (height) of 11 km. What is the angle of elevation that Robbie drove up?

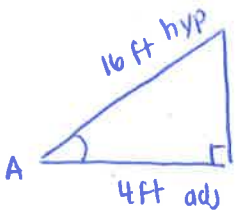


$\sin A = \frac{11}{28}$

$m\angle A = \sin^{-1}(11/28)$

$\boxed{m\angle A = 23.1^\circ}$

35. You lean a 16 foot ladder against the wall where the base of the ladder is 4 feet away from the wall. What angle does the ladder make with the ground?



$\cos A = \frac{4}{16}$

$m\angle A = \cos^{-1}(4/16)$

$\boxed{m\angle A = 75.5^\circ}$