SOL G.8

Learning Target: By the end of class I will be able to use trigonometric ratios to find missing sides in right triangles, and will do this by completing a series of problems as a class before completing an exit ticket with at least 3 of 4 questions answered correctly.

Essential Questions:

- How is the Pythagorean Theorem derived and what is significant about its derivation?
- How are ratios used to solve for unknown lengths of sides in a right triangle?
- How are ratios utilized to solve for unknown angles in a right triangle?
- How are similar right triangles related to trigonometric ratios?

Right Triangle Trigonometry

Today's Agenda

- ✓Quiz Review
- ✓PT Practice
- ✓SOH-CAH-TOA
- ✓Using Sin, Cos, and Tan
- ✓Exit Ticket

CODE YELLOW

1. Write the Pythagorean Theorem.

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

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

CODE YELLOW

2. Which of the following sets of numbers will ***NOT*** form a right triangle?

a) 15, 36, 39

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

$39^2 = 15^2 + 36^2$

$1521 = 225 + 1296$

$1521 = 1521$ ✓

b) 8, 13, 15

$15^2 = 8^2 + 13^2$

$225 = 64 + 169$

$225 < 233$

acute

c) 3, 5, 4

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

$5^2 = 3^2 + 4^2$

$25 = 9 + 16$

$25 = 25$

CODE YELLOW

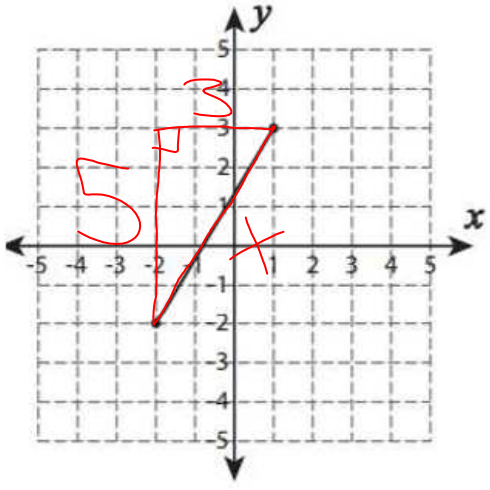
3. Circle the numbers that could represent the sides of a right triangle:

12 (144)	15 (225)	19 (361)
31 (961)	35 (1225)	37 (1369)

$144+1225=1369$

CODE YELLOW

4. Find the length of the line segment.



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

$x^2=5^2+3^2$

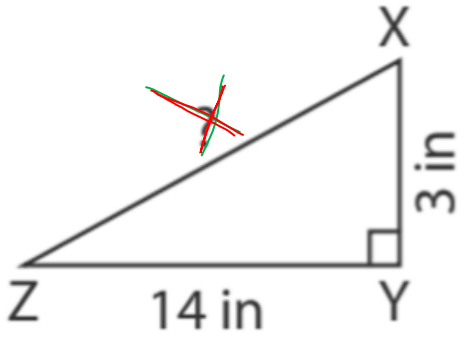
$x^2=25+9$

$x^2=34$

$x=5.8$

CODE YELLOW

5. Find the missing side and round to the nearest tenth.



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

$x^2 = 3^2 + 14^2$

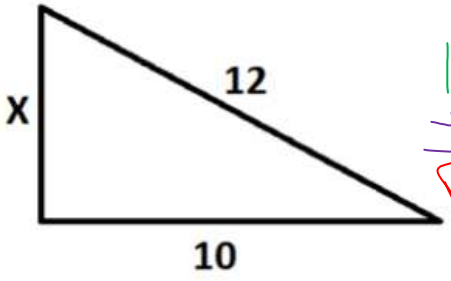
$x^2 = 9 + 196$

$x^2 = 205$

$x = 14.3$

CODE YELLOW

6. Solve for X and round to the nearest tenth.



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

$12^2 = x^2 + 10^2$

$144 = x^2 + 100$

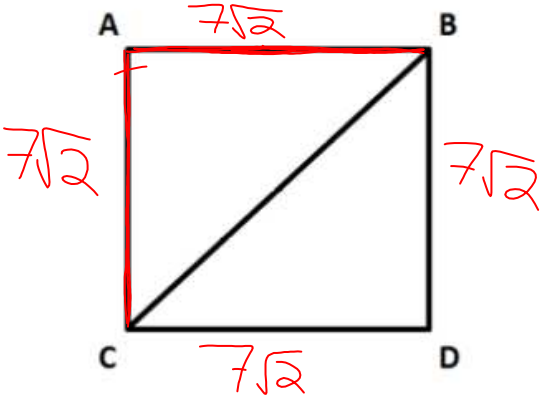
$-100 \quad -100$

$44 = x^2$

$x = 6.6$

CODE YELLOW

7. Given Square ABCD, if BA = $7\sqrt{2}$, what is AC?



$7\sqrt{2}$

CODE YELLOW

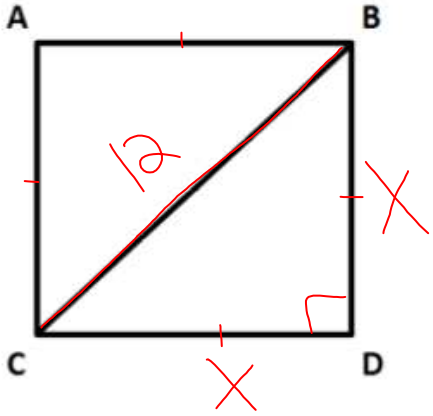
8. Given Square ABCD, if BC = 12, what is CD?

a) 6

b) $12\sqrt{2}$ = 16.9

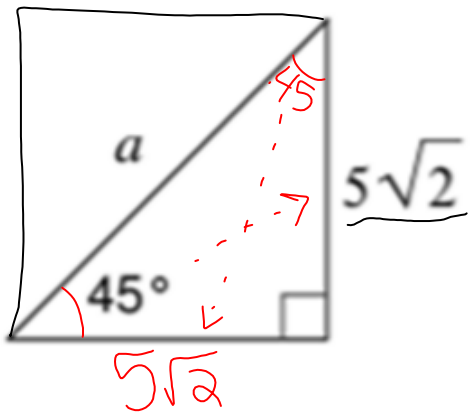
c) $6\sqrt{2}$ = 8.5

d) 12



CODE YELLOW

9. What is the length of the hypotenuse?



$5\sqrt{2} \times \sqrt{2}$

10

CODE YELLOW

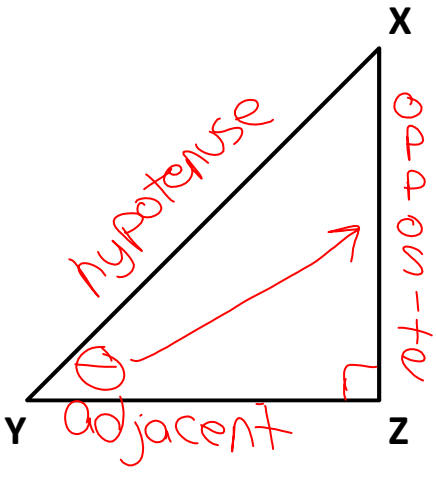
Vocabulary

Θ (Theta) – an unknown angle

Reference Angle – the angle used to determine trigonometric functions

Opposite – the side ***across*** from the given angle

Adjacent – the side ***next*** to the given angle



CODE YELLOW

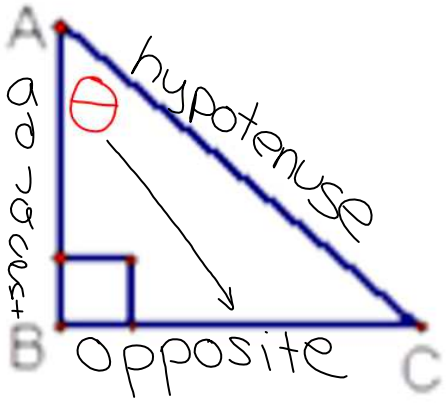
Given ΔABC…

If A is the reference angle,

opposite

adjacent

hypotenuse



CODE YELLOW

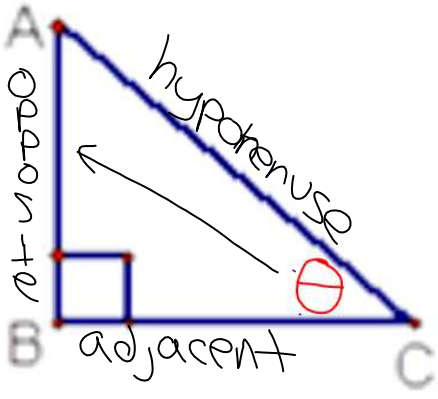
Given ΔABC…

If C is the reference angle,

opposite

adjacent

hypotenuse



CODE YELLOW

Trigonometric Functions:

Sine

Cosine

Tangent

CODE YELLOW

Trigonometric Functions:

$$Sin = \frac{Opp}{Hyp}$$

CODE YELLOW

Trigonometric Functions:

$$Cos = \frac{Adj}{Hyp}$$

CODE YELLOW

Trigonometric Functions:

$$Tan = \frac{Opp}{Adj}$$

CODE YELLOW

Trigonometric Functions:

SOH-CAH-TOA

$$Sin = \frac{Opp}{Hyp} \quad Cos = \frac{Adj}{Hyp} \quad Tan = \frac{Opp}{Adj}$$

SOH CAH TOA

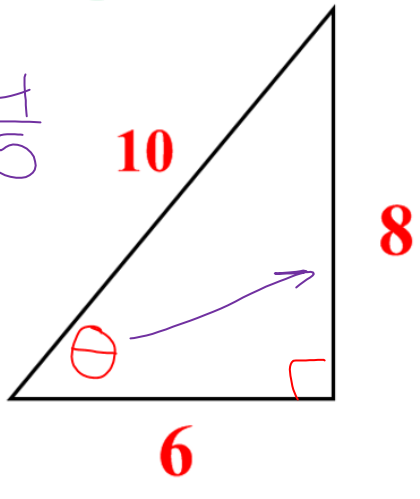
CODE YELLOW

SOH-CAH-TOA

$$\sin\theta = \frac{opp}{hyp} \quad \frac{8}{10} = \frac{4}{5}$$

$$\cos\theta = \frac{adj}{hyp} \quad \frac{6}{10} = \frac{3}{5}$$

$$\tan\theta = \frac{opp}{adj} \quad \frac{8}{6} = \frac{4}{3}$$



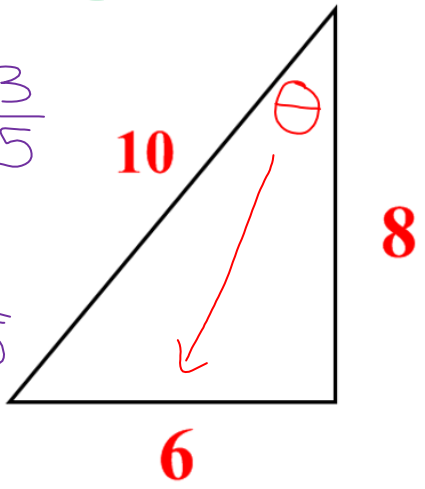
CODE GREEN

SOH-CAH-TOA

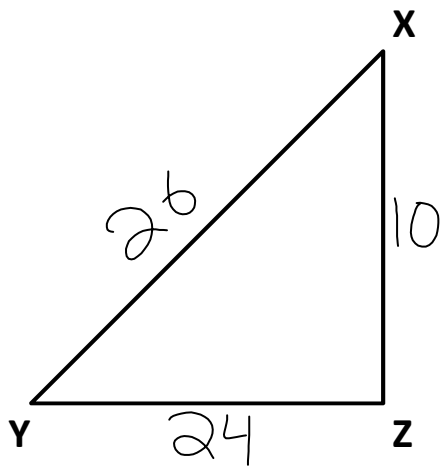
$$\sin\theta = \frac{opp}{hyp} = \frac{6}{10} = \frac{3}{5}$$

$$\cos\theta = \frac{adj}{hyp} = \frac{8}{10} = \frac{4}{5}$$

$$\tan\theta = \frac{opp}{adj} = \frac{6}{8} = \frac{3}{4}$$



CODE RED – EXIT TICKET



Simplify each fraction:

Sin x = $\frac{24}{26} = \frac{12}{13}$ Sin y = $\frac{10}{26} = \frac{5}{13}$

Cos x = $\frac{10}{26} = \frac{5}{13}$ Cos y = $\frac{24}{26} = \frac{12}{13}$

Tan x = $\frac{24}{10} = \frac{12}{5}$ Tan y = $\frac{10}{24} = \frac{5}{12}$