Name: _____

Example:

Albert is standing on a street looking at the top of a building with a 45° angle of elevation. He is 413.7 meters from the building. How tall is the building? *Express your answer as a decimal to the nearest tenth.*

*I want the opposite side(O) & I have the adjacent side(A), so those are the two that I will use. I **will not** use the hypotenuse(H), because I do not have it or want it.*

SO~~H~~ CA~~H~~ TOA

$$tanA = \frac{opp}{adj}$$

$$tan45 = \frac{?}{413.7}$$

$$\frac{tan45}{1} = \frac{?}{413.7}$$

$$413.7(tan45) = ?$$

*On a forwards-functioning calculator, type 413.7 x tan45 =*
On a backwards-functioning calculator, type 413.7 x (45tan) =

$$? = 413.7(tan45)$$

$$? = \boxed{413.7\ m}$$

This is also a special triangle (45-45-90), so you can use special triangle rules: both sides opposite the 45 degree angles are congruent to each other. Beware! 30-60-90 triangles have a different rule.
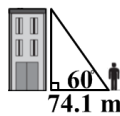
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1. Eddie is standing on a street looking at the top of a building with a 30° angle of elevation. He is 372.8 meters from the building. How tall is the building? *Express your answer as a decimal to the nearest tenth.*


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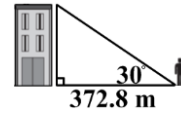
2. Michael is standing on a street looking at the top of a building with a 45° angle of elevation. He is 494.2 meters from the building. How tall is the building? *Express your answer as a decimal to the nearest tenth.*

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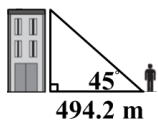
3. Alice is standing on a street looking at the top of a building with a 60° angle of elevation. She is 74.1 meters from the building. How tall is the building? *Express your answer as a decimal to the nearest tenth.*


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4. Noah is standing on a street looking at the top of a building with a 30° angle of elevation. He is 153.1 meters from the building. How tall is the building? *Express your answer as a decimal to the nearest tenth.*
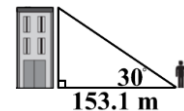
Example:
A student was asked to solve for each of the variables in the diagram below, rounding side lengths to the nearest tenth, if necessary. Which one of the variables did the student solve incorrectly?
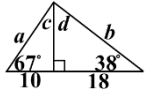
A. $a = 25.6$
B. $b = 14.1$
C. $c = 23°$
D. $d = 52°$

To solve for a & b, use trigonometry.
$$cos67 = \frac{10}{a}$$
$$a(cos67) = 10$$
$$a = \frac{10}{cos67}$$
Type into the calculator: $10÷(cos67)=$ *or* $10÷(67cos)=$
<u>*a = 25.6 is correct*</u>
$$cos38 = \frac{18}{b}$$
$$b(cos38) = 18$$
$$b = \frac{18}{cos38}$$
Type into the calculator: $18÷(cos38)=$ *or* $18÷(38cos)=$
<u>*b = 22.8 ←The answer given for b was INCORRECT*</u>

To solve for c & d, use the triangle sum theorem.
$$90 + 67 + c = 180$$
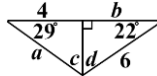$$157 + c = 180$$
<u>*c = 23 is correct.*</u>
$$90 + 38 + d = 180$$
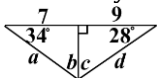$$128 + d = 180$$
d = 52 is correct.

$\boxed{\textit{B is incorrect}}$

5. A student was asked to solve for each of the variables in the diagram below, rounding side lengths to the nearest tenth, if necessary. Which one of the variables did the student solve incorrectly?

A. $a = 4.6$
B. $b = 6.5$
C. $c = 61°$
D. $d = 68°$

6. A student was asked to solve for each of the variables in the diagram below, rounding side lengths to the nearest tenth, if necessary. Which one of the variables did the student solve incorrectly?
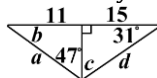
A. $a = 8.4$
B. $b = 56°$
C. $c = 72°$
D. $d = 10.2$

7. A student was asked to solve for each of the variables in the diagram below, rounding side lengths to the nearest tenth, if necessary. Which one of the variables did the student solve incorrectly?
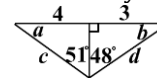
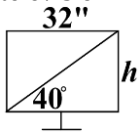A. $a = 16.1$
B. $b = 43°$
C. $c = 59°$
D. $d = 17.5$

8. A student was asked to solve for each of the variables in the diagram below, rounding side lengths to the nearest tenth, if necessary. Which one of the variables did the student solve incorrectly?
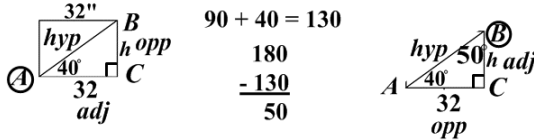
A. $a = 39°$
B. $b = 42°$
C. $c = 5.1$
D. $d = 2.2$

Example:
A television measures 32 inches across the bottom. The diagonal makes a 40° angle with the bottom of the television.

32"

h

40°

Identify all trig equations that can be used to solve for the height, h, of the television screen.

32" B
hyp h opp
$40°$ C
Ⓐ 32
adj

$90 + 40 = 130$
180
$- 130$
50

Ⓑ
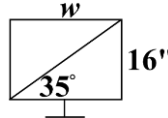hyp 50 h adj
A $40°$ C
32
opp

SOH CAH TOA

$$sin(40) = \frac{h}{AB}, cos(40) = \frac{32}{AB}, \boxed{tan(40) = \frac{h}{32}}$$
$$sin(50) = \frac{32}{AB}, cos(50) = \frac{h}{AB}, \boxed{tan(50) = \frac{32}{h}}$$

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9. A television measures 16 inches in height. The diagonal makes a 35° angle with the bottom of the television.
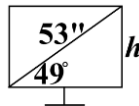
w

$35°$ **16"**

Identify all trig equations that can be used to solve for the width, w, of the television screen.

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10. A 50" television measures 50 inches across the diagonal. The diagonal makes a 25° angle with the bottom of the television.
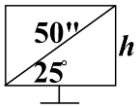
50" h
25°

Identify all trig equations that can be used to solve for the height, h, of the television screen.

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11. A 53" television measures 53 inches across the diagonal. The diagonal makes a 49° angle with the bottom of the television.
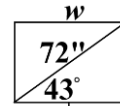
53" h
49°

Identify all trig equations that can be used to solve for the height, h, of the television screen.

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12. A 72" television measures 72 inches across the diagonal. The diagonal makes a 43° angle with the bottom of the television.

w

72"
43°

Identify all trig equations that can be used to solve for the width, w, of the television screen.

Semester 2 Final Review F
Solving Trigonometric Ratios Answers:

1. 215.2 m	2. 494.2 m	3. 128.3 m	4. 88.4 m	5. B	6. C
7. A	8. D	9. $tan55° = \frac{w}{16}$ & $tan35° = \frac{16}{w}$	10. $sin25° = \frac{h}{50}$ & $cos65° = \frac{h}{50}$	11. $sin49° = \frac{h}{53}$ & $cos41° = \frac{h}{53}$	12. $cos43° = \frac{w}{72}$ & $sin47° = \frac{w}{72}$