☐ **DO NOW – Geometry Regents Lomac 2014-2015** **Date** ____. **due** ____. **Similarity Opposite Adjacent Hypotenuse** **7.3**

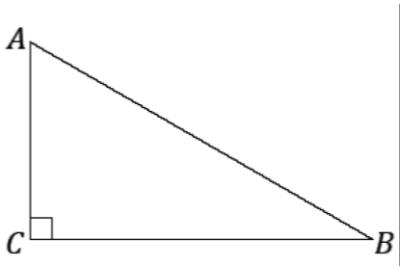
(DN) ON BACK OF PACKET

Name _____**Per**_____

LO: I can recognize the connection between a reference angle and a particular side ratio.

☐ (1) **Similar Right Triangles: Opposite**

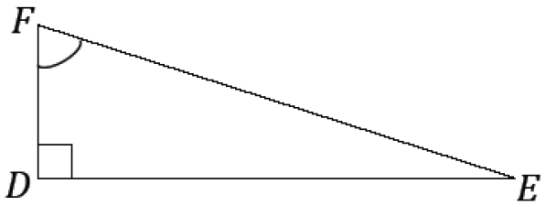
1. Name the side of the triangle opposite ∠A. _____
2. Name the side of the triangle opposite ∠B. _____
3. Name the side of the triangle opposite ∠C. _____



☐ (2) **Similar Right Triangles: Opposite, Hypotenuse, and Adjacent**

For each diagram, label the appropriate sides as opposite, and hypotenuse, with respect to the marked acute angle (**reference** angle).

4.



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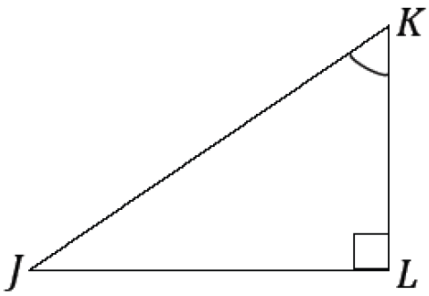

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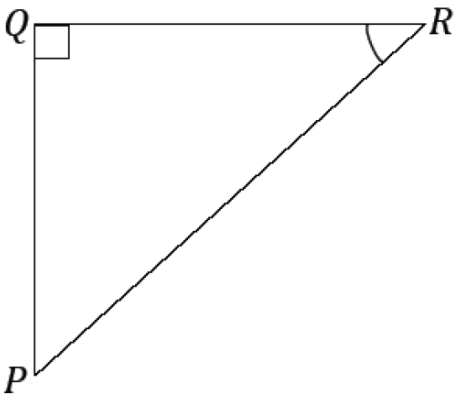
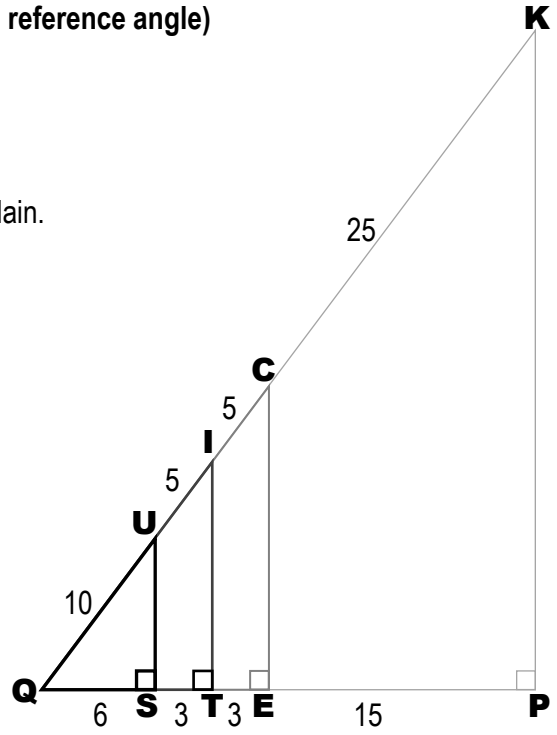


One side of each triangle isn't labeled. Label it "adjacent" now. Adjacent means "next to." Adjacent sides are next to the reference angle.

☐ (3) calculator **Similar Right Triangles: adjacent/hypotenuse (cosine of the reference angle)**

Observe the diagram at right.



☐ (a) How many triangles do you see? _____

☐ (b) How many of those triangles are similar? _____ Explain.

☐ (c) Write 4 "within triangle" ratios, one for each triangle.
Write the ratios so their values are all less than one.

with letters:

_____ _____ _____ _____

with numbers:

_____ _____ _____ _____

as a decimal:

_____ _____ _____ _____

☐ (d) What do you notice about all of the ratios you wrote for part (c) ?_____

☐ (e) Would the ratios still be equal if the triangles were floating apart from one another in the plane? _____

☐ (f) Is angle Q the same measure for all of the triangles? _____ because _____

☐ (g) Angle Q is our reference angle. Mark it.
That means 10, 15, 20, and 45 are each the _____of a triangle.

AND 6, 9, 12, and 27 are all _____ sides.

☐ (h) Based on what you wrote in part (g), all of the ratios you wrote for part (c) relate the _____

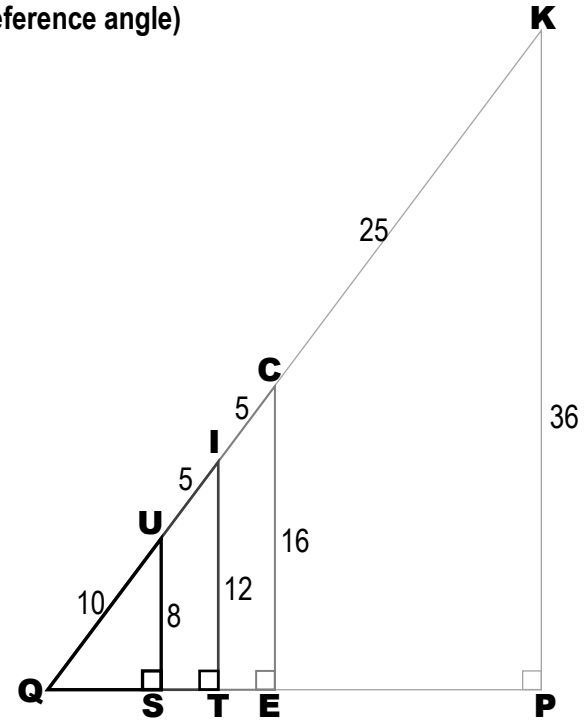
to the _____ which were written _____.

☐ (i) Angle Q in the diagram is 53.13°.
The ratio adjacent/hypotenuse for all of the triangles in the diagram is _____.
ALL right triangles with a 53.13° reference angle will have adjacent/hypotenuse ratios that are equal to _____

Type cos(53.13°) into your calculator. Do you get the same decimal value you did in part c?_____
That is because, you are saying to your calculator: ***"Hey, calculator. I have this triangle with a 53.13° angle and I want to know the ratio of the adjacent side to the hypotenuse. What is it?*** The way you ask all of this is to type: cos(53.13)

☐ (4) calculator **Similar Right Triangles: opposite/hypotenuse (sine of the reference angle)**

☐ Observe the diagram at right.



☐ (c) Write 4 "within triangle" ratios, one for each triangle.
Write the ratios so their values are all less than one.

with letters:

_____ _____ _____ _____

with numbers:

_____ _____ _____ _____

as a decimal:

_____ _____ _____ _____

☐ (d) What do you notice about all of the ratios you wrote for part (c) ?_____

☐ (e) Would the ratios still be equal if the triangles were floating apart from one another in the plane? _____

☐ (f) Is angle Q the same measure for all of the triangles? _____ because _____

☐ (g) Angle Q is our reference angle. Mark it.
That means 10, 15, 20, and 45 are each the _____of a triangle.

AND 8, 12, 16, and 36 are all _____ sides.

☐ (h) Based on what you wrote in part (g), all of the ratios you wrote for part (c) relate the _____

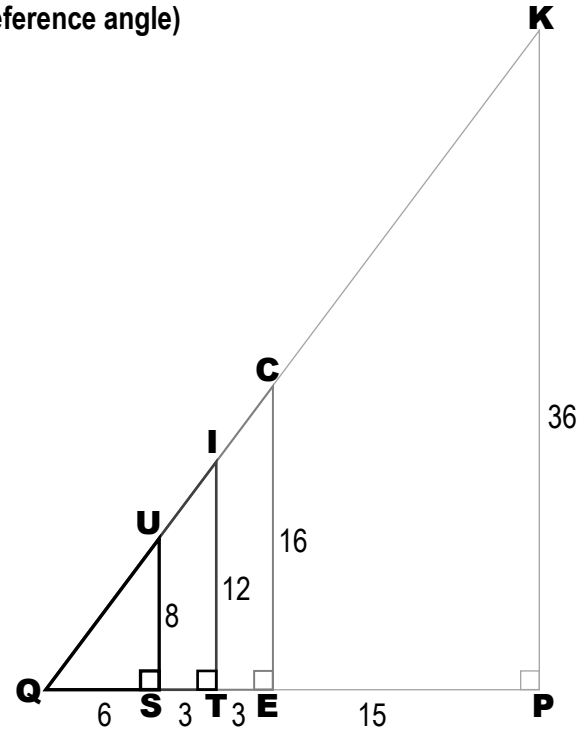
to the _____ which were written _____.

☐ (i) Angle Q in the diagram is 53.13°.
The opposite/hypotenuse ratio for all of the triangles in the diagram is _____.
ALL right triangles with a 53.13° reference angle will have opposite/hypotenuse ratios that are equal to _____

Type sin(53.13°) into your calculator. Do you get the same decimal value you did in part c?_____
That is because, you are saying to your calculator: ***"Hey, calculator. I have this triangle with a 53.13° angle and I want to know the ratio of the opposite side to the hypotenuse. What is it?*** The way you ask all of this is to type: sin(53.13)

☐ (5) calculator **Similar Right Triangles: opposite/adjacent (tangent of the reference angle)**

☐ Observe the diagram below.



☐ (c) Write 4 "within triangle" ratios, one for each triangle.
Write the ratios so their values are all greater than one.

with letters:

_____ _____ _____ _____

with numbers:

_____ _____ _____ _____

as a decimal:

_____ _____ _____ _____

☐ (d) What do you notice about all of the ratios you wrote for part (c) ?_____

☐ (e) Would the ratios still be equal if the triangles were floating apart from one another in the plane? _____

☐ (f) Is angle Q the same measure for all of the triangles? _____ because _____

☐ (g) Angle Q is our reference angle. Mark it.
That means 8, 12, 16, and 36 are each the _____of a triangle.

AND 6, 9, 12, and 27 are all _____ sides.

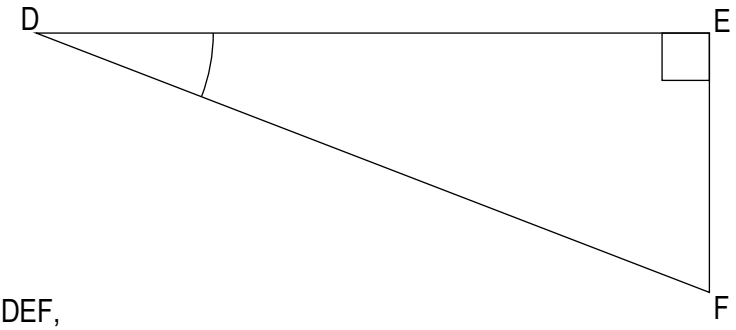
☐ (h) Based on what you wrote in part (g), all of the ratios you wrote for part (c) relate the _____

to the _____ which were written _____.

☐ (i) Angle Q in the diagram is 53.13°.
The opposite/adjacent ratio for all of the triangles in the diagram is _____.
ALL right triangles with a 53.13° reference angle will have opposite/ adjacent ratios that are equal to _____

Type tan(53.13°) into your calculator. Do you get the same decimal value you did in part c?_____
That is because, you are saying to your calculator: ***"Hey, calculator. I have this triangle with a 53.13° angle and I want to know the ratio of the opposite side to the adjacent side. What is it?*** The way you ask all of this is to type: tan(53.13)

☐ (3) calculator **Similar right triangles: Summary**



In the diagram of triangle DEF,

the reference angle is _____

the opposite side is _____

the hypotenuse is _____

the adjacent side is _____

Label the reference angle, opposite, hypotenuse, and adjacent in the diagram

Right triangles with congruent reference angles are _____

Because right triangles with congruent reference angles are _____ we can use the reference angle and a calculator to find the values for the ratios of pairs of sides. Sine, cosine, and tangent give us ratios comparing different sides.

parts (opp, hyp, adj) side names (DE, EF, FD)

$\sin\angle D$ = _____ $\sin\angle D$ = _____

$\cos\angle D$ = _____ $\cos\angle D$ = _____

$\tan\angle D$ = _____ $\tan\angle D$ = _____

☐ (7) calculator **Exit Ticket**

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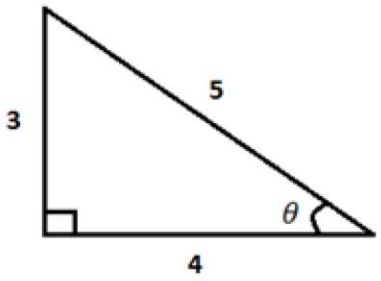
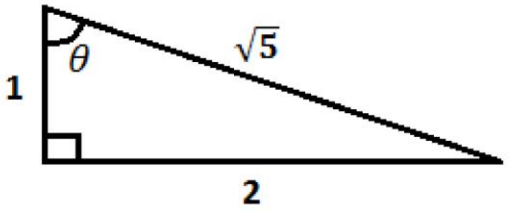
☐ (8) compass and straightedge **Homework**



Opposite side =

Adjacent side =

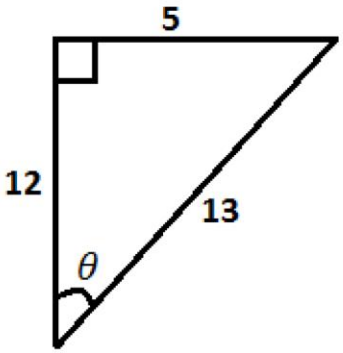
Hypotenuse =



Opposite side =

Adjacent side =

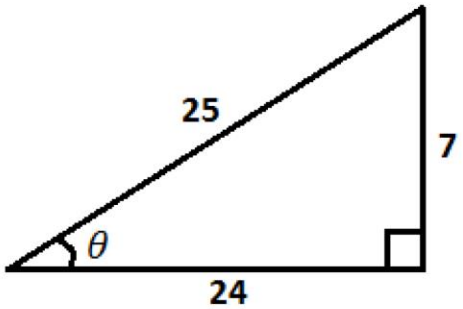
Hypotenuse =



Opposite side =

Adjacent side =

Hypotenuse =



Opposite side =

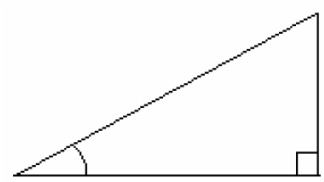
Adjacent side =

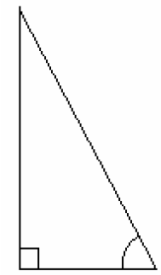
Hypotenuse =

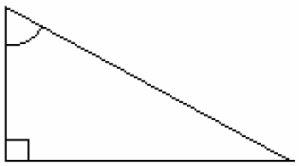
☐ (8) calculator

Homework

Label the opposite, hypotenuse, and adjacent for each triangle.

1. 

2. 

3. 

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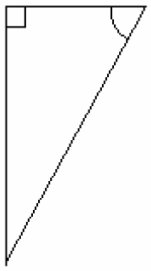
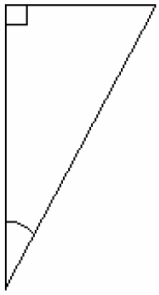
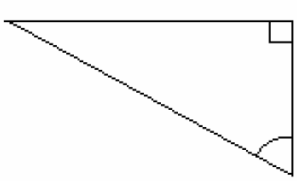
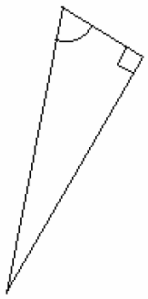
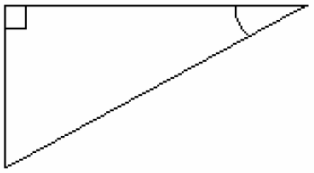
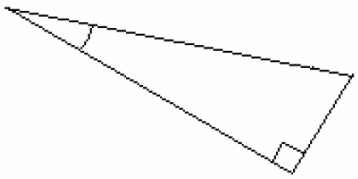
5. 

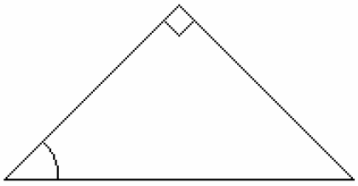
6. 

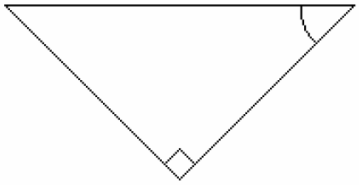
7. 

8. 

9. 

10. 

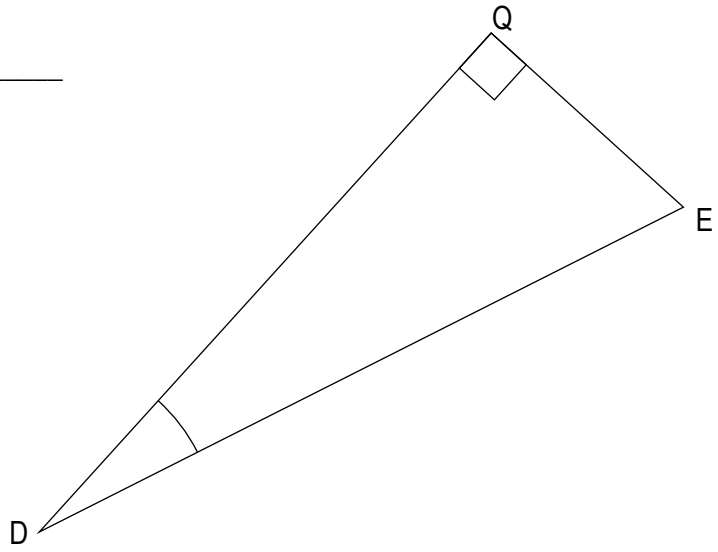
11. 

12. 

Exit Ticket **Name**_____ **Date** _____ **Per**_____ **7.3**

Use the diagram below to complete each part.

(a) Identify the reference angle _____



(b) Identify each side

Opposite _____

Hypotenuse _____

Adjacent _____

(c) Complete each ratio with names of sides.

Is this the sine, cosine or tangent ratio? (circle one)

$\frac{opposite}{hypotenuse}$ _____ sine cosine tangent

$\frac{adjacent}{hypotenuse}$ _____ sine cosine tangent

$\frac{opposite}{adjacent}$ _____ sine cosine tangent

(d) Can a triangle ABC exist that has the same tangent, sine, and cosine ratios as triangle DQE, but is not congruent to triangle DQE? Explain. You may also make a sketch or draw on the diagram at the top of the page to help you answer this question.

DO NOW **Name**_____ **Date** _____ **Per**_____ **7.3**

Simplify each expression.

(1) $\sqrt{270}$ (2) $\sqrt{6} \cdot \sqrt{18}$ (3) $5\sqrt{7} - 2\sqrt{14}$