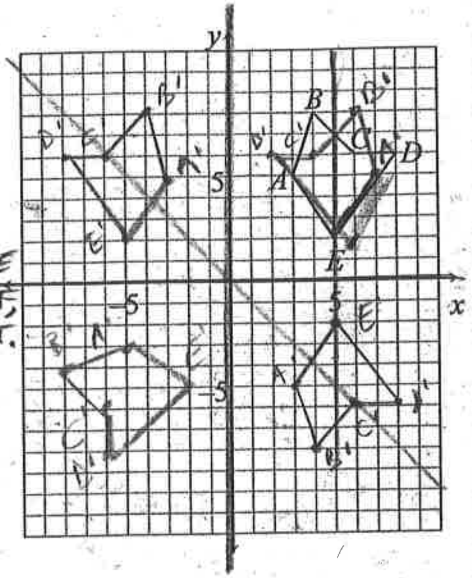
Transformation GO (Graphic Organizer)

(PINK)

Use this GO to consolidate and organize your knowledge on the three rigid transformations: rotations, reflections, and translations.



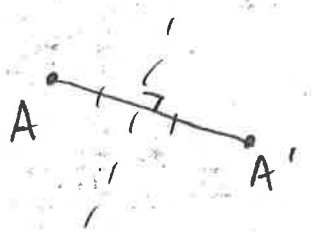
Reflections

1. In your own words, describe what a reflection is.
MOVEMENT PLACING AN IMAGE THE SAME DISTANCE FROM, & DIRECTLY OPPOSITE OF, ACCROSS A GIVEN LINE FROM, AN OBJECT.

2. On the grid at right, reflect *ABCDE* four different ways. For example, reflecting across the *x*-axis would be different than reflecting across a diagonal line. At least one line of reflection should pass through the interior of *ABCDE*. Color-code each reflection with its line of reflection.

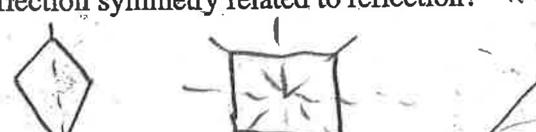
3. What happens to a shape's reflection if the line of reflection is moved farther away from the object? What happens if it is moved closer?
THE IMAGE IS ALWAYS AS FAR FROM THE LINE OF REFLECTION AS WAS THE ORIGINAL

4. If a line segment connects a point with its reflected image, explain the relationship between this line segment and the line of reflection. Draw an example at right.



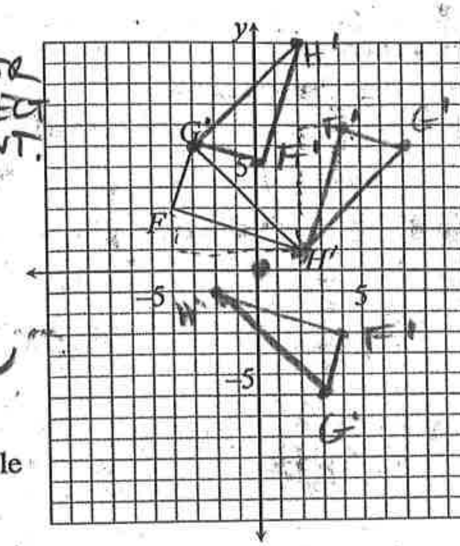
THE LINE OF REFLECTION INTERSECTS THIS SEGMENT AT A RT ∠ & DIVIDES THIS SEGMENT IN HALF

5. Draw several geometric shapes you have studied so far that have this type of symmetry. How is reflection symmetry related to reflection? THESE OBJECTS REFLECT ONTO THEMSELVES ACROSS A LINE THAT PASSES THROUGH THEM



Transformation GO (Graphic Organizer)

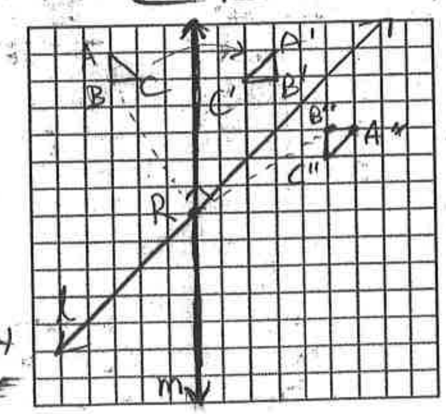
Rotations



1. In your own words, describe what a rotation is.
MOVEMENT THROUGH A NUMBER OF DEGREES, IN A GIVEN DIRECTION (CW/CCW) ABOUT A GIVEN POINT.

2. On the grid at right, rotate *FGH* three different ways. Each way should have a different point of rotation and a different angle of rotation. At least one point of rotation should be a vertex of *FGH*. Color-code each point of rotation with its rotated image.
180° ABOUT ORIGIN — 90° CW ABOUT H — 90° CCW ABOUT G

3. Explain everything you know about rotation angles. For example, can you give an example of two possible rotations that would create the exact same image? When is it not necessary to identify if the rotation is counter-clockwise versus clockwise?
180° IS SAME IN EITHER DIRECTION, BUT FOR ALL OTHER ∠s, MUST SPECIFY DIRECTION. EVERY POINT ON AN OBJECT IS ROTATED THROUGH THE SAME ∠, SO THE ∠ B/N EA PT & ITS IMAGE IS UNIFORM FOR EA ROTATION.



4. Explain the relationship between rotations and reflections. How can you use reflections to rotate a figure? Create an example of a way to use reflections to rotate a figure 90° clockwise on the grid at right. Be sure to show the lines of reflection as well as the point of rotation.
2 SUCCESSIVE REFLECTIONS IN INTERSECTING LINES PRODUCES A ROTATION THROUGH AN ∠ TWICE THE MEASURE OF THE ∠ OF INTERSECTION.

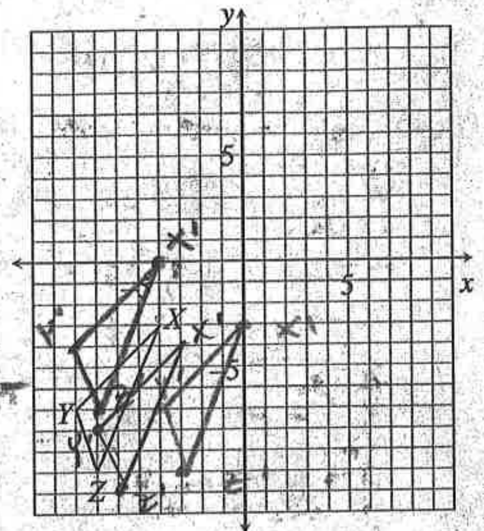
5. Draw several geometric figures you have studied so far that have this type of symmetry. How is rotation symmetry related to rotation? THESE OBJECTS ROTATE ONTO THEMSELVES ABOUT THEIR CENTERS

Transformation GO (Graphic Organizer)

Translations

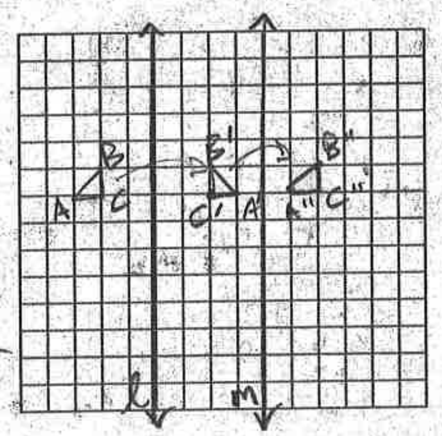
1. In your own words, describe what a translation is.

SLIDE THAT PRESERVES ORIENTATION



2. On the grid at right, translate *XYZ* three different times to three different locations. For each translation, describe the translation (such as "up 2 units and to the right 4 units") below. Color-code the translated image with the description below.

UP 3 UNITS, OVER NO UNITS
UP NO UNITS, 4 UNITS RIGHT
DOWN 1 UNIT, RIGHT 1 UNIT



3. Explain the relationship between translations and reflections. How can you use reflections to translate a shape? Create an example of a way to use reflections to translate a figure 8 units to the right on the grid at right. Be sure to show the lines of reflection.

2 SUCCESSIVE REFLECTIONS IN || LINES PRODUCE TRANSLATION TWICE AS FAR AS DISTANCE B/W || LINES.

4. Explain everything you know about naming transformations. For example, if a figure *PQR* is transformed repeatedly, what should the images be named? And if you are given the names of a shape and its image, what does the letter order convey?

THE LETTER ORDER INDICATES THAT VERTICES IN A CERTAIN POSITION FOR THE PRE-IMAGE CORRESPOND TO THOSE IN THE SAME POSITION FOR THE IMAGE. EA SUCCESSIVE TRANSFORMATION ADDS A TICK MARK: $\triangle ABC \to \triangle A'B'C' \to$

10/6/15

Portfolio: Evidence of Mathematical Proficiency

HEGEDUS

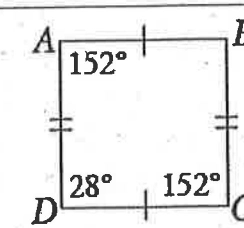
Think about the diagrams that you have looked at or drawn during this chapter. When have you had to understand information from a diagram or picture? What helps you to see what is in the diagram? What diagrams or parts of diagrams have you seen in a previous math class? You may want to flip through the chapter to refresh your memory about the problems that you have worked on.

At your table, discuss any of the methods you have developed to examine a problem in order to identify what is important or what information is conveyed in a diagram. Write a summary of your discussion here:

NOTE HOW SHAPES MAY COMBINE IN TERMS OF AREAS, LENGTHS & ∡ MEASURES ADDING TOGETHER & HOW OBJECTS (LINES, RAYS, SEGMENTS, ∡S) RELATE (⊥, ||, ≅, BISECT, SPECIAL GEOMETRIC RELATIONSHIPS) & PROPERTIES OF POLYGONS & TYPES & ∡-MEASURE OF POLYGONS

After your discussion and summary are complete, think about the way you think as you answer the following problems.

a. Sometimes, examining a shape means you have to disregard how it *looks* and concentrate on the information provided by the markings. For example, examine the shape at right. This shape looks like a square, but is it? *Make as many statements as you can about this shape based on the markings.* What shape is *ABCD?* Which statements are obvious from the diagram and which ones did you have to think about?



Work/Solution(s): ALTHOUGH IT LOOKS AT FIRST GLANCE LIKE A SQUARE, THE ≅ MARKS SHOW THAT, ALTHOUGH $\overline{AB} \cong \overline{CD}$ & $\overline{BC} \cong \overline{AD}$, $\overline{AB} \not\cong \overline{BC}$, $\overline{AB} \not\cong \overline{AD}$, $\overline{BC} \not\cong \overline{CD}$ & $\overline{CD} \not\cong \overline{AD}$, SO ONE MIGHT CONCLUDE ABCD IS A RECTANGLE, UNTIL S/HE CONSIDERS THAT m∡s ≠ 90°; FURTHER INSPECTION REVEALS THAT SSIAs ARE SUPP ($m\angle A + m\angle D = 180°$ & $m\angle C + m\angle D = 180°$), SO $\overline{AD} \parallel \overline{BC}$ & $\overline{AB} \parallel \overline{CD}$ & QUADRILATERAL ABCD IS ∴ A ▱.

What is the main point (or purpose) of this problem?

CLOSE INSPECTION, CONSIDERATION & CONNECTIONS TO PRIOR KNOWLEDGE SUBRATE INITIAL, SUPERFICIAL IMPRESSIONS. SOMETIMES QUANTITATIVE ANALYSIS YIELDS USEFUL INFORMATION & UNDERSTANDING THAT CONTRADICTS ORIGINAL INTERPRETATIONS. ALTHOUGH RECOGNIZING PATTERNS CAN PROVIDE INSIGHT, PRUDENT METHODOLOGY RECOMMENDS SUSPENSION OF CONFIDENCE IN UNVERIFIED & HASTY ASSUMPTIONS.

Translation

1. In your

SI

2. On the g times to translatio 2 units a the trans

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UP

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3. Explain reflectio a shape? reflectio the grid reflectio

2 S

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4. Explain transform of a shap

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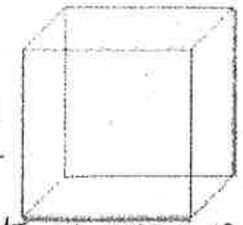
b. At other times, examining a diagram suggests that you notice different parts that contribute to the entire diagram. For example, look at the diagram at right. *Assuming that the diagram is drawn to scale*, what shapes can you find in the diagram? IF IT'S JUST 2-DIMENSIONAL, I SEE QUADRILATERALS (MAYBE ▱S, SQUARES & TRAPEZOIDS) & TRIANGLES, BUT IF ITS MEANT TO DEPICT A 3-DIMENSIONAL FIGURE, THEN I STILL SEE SOME POLYGONS (PROBABLY SQUARES, ALTHOUGH, AS IN THE 2-D SITUATION, LACK OF m∡S & SIDE LENGTHS PROHIBIT CERTAINTY BEYOND QUADRILATERALS) AS FACES OF A POLYHEDRON (A QUADRILATERAL-BASED PRISM OR CUBE, DEPENDING ON m∡S & SIDE LENGTHS).

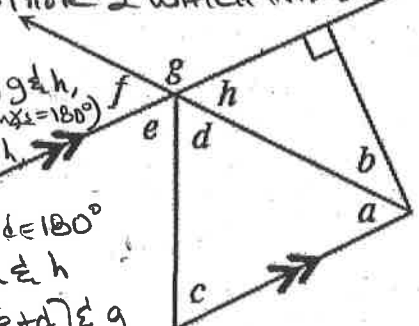


c. In part (a), you looked for attributes of a shape, while in part (b), you looked for shapes within a shape. However, another aspect of examining a diagram is to look for relationships between parts of the diagram. For example, examine the diagram below. What relationships do you see between the angles in the diagram? What relationships can you find between the lines and/or line segments? ***List as many relationships as you can based on the information in the diagram.***

2 ∥ LINES CUT BY 3 TRANSVERSALS, 1 OF WHICH IS ⊥ TO THE ∥ LINES & THE OTHER 2 WHICH INTERSECT 1 OF THE ∥ LINES AT A COMMON PT.

STRAIGHT ∡ PRS [& TRIOS]: F & g, g & h, F & e & d, e & d & h. (SUPP/SUM m∡S = 180°)

COMPLIMENTARY ∡ PRS: a & b, b & h



△ SUM: b + h + 90° = 180°, a + c + d = 180°

AIAs [≅ B/C LINES ∥]: c & e, a & h

VERT ∡ PR: F & h [≅], [e+d] & g

SSIAs: [e+d] & a, [h+d] & c [SUM OF m∡S = 180° B/C LINES ∥]

CORRESP ∡ PRS: a & F [B/C LINES ∥ a = f]

ART △ & A TRAPEZOID ARE PRESENT

d. Consider the relationships you saw in part (c) above. Which relationships are always true, and which are true only under certain conditions?

ALWAYS: • STRAIGHT ∡S HAVE SUM OF m∡S = 180°
• △S HAVE " " " " " "
• VERT ∡S ARE ≅

WHEN △S HAVE RT ∡: • ACUTE ∡S ARE COMPLIMENTARY

WHEN LINES ARE ∥: • AIAs ARE ≅
• SSIAs ARE SUPP

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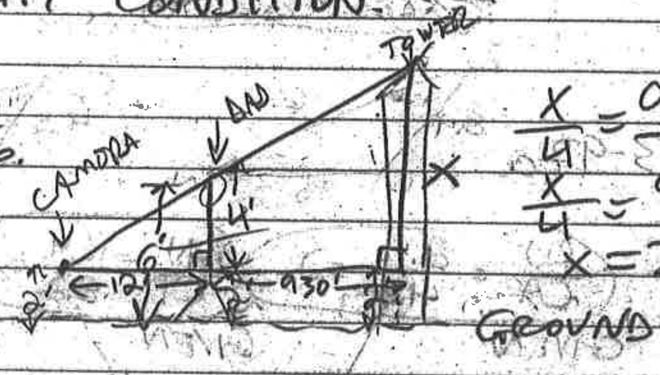
JOURNAL: MATHEMATICA PRACTICES

IN 3-106, MP1 APPLIES TO COMBINING ~△s, PROPORTIONS, CROSS-PRODUCT PROPERTY, & SEGMENT ADDITION, TO USING DIAGRAMS & EQ'NS, & [COULD BE CHECKED W/ TRIG RATIOS]. MP2 APPLIES TO USING ~△s TO WRITE PROPORTION & INCLUDING FEET AS UNITS ON DIAGRAM & IN ANSW MP4 APPLIES TO DESCRIBING THE SITUATION & △s THAT DON'T ACTUALLY PHYSICALLY EXIST MP5 APPLIES TO USING DIAGRAMS & PROPORTIONS. IN 3-97a, MP.3 APPLIES TO PRESENTING FACTS IN ORDER, CONNECTED BY ARROWS, JUSTIFIED BY STATEMENTS OF DEFINITIONS & THEOREMS & INCLU-ING SIMPLIFIED RATIOS FOR COMPARISON; MP.6 APPLIES TO USING THE NAME FOR THE SIMILARITY CONDITION.

3-106.



$$\frac{x}{4} = \frac{930+12}{12}$$

$$\frac{x}{4} = \frac{942}{12}$$

$$x = 314'$$

TOWER = 314 + 2 = $\boxed{316'}$

3-97a SEE INB p

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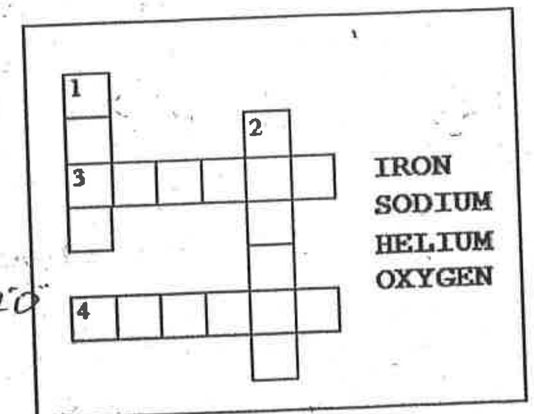
PORTFOLIO: EVIDENCE OF MATHEMATICAL PROFICIENCY

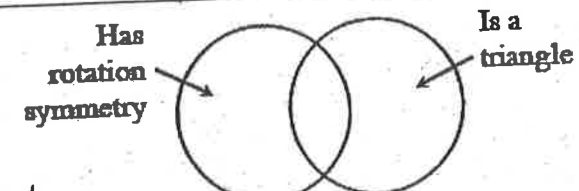
Think about the way you think, as you answer the questions below. When did you need to make sense out of multiple pieces of information? What helps you to determine what makes sense? Were there times when you made assumptions instead of relying on facts? How have you used reasoning in a previous math class?

a. At right is a crossword puzzle and a list of words that fit within the puzzle. Do you know where all of the words MUST go or is there more than one possible solution? Write an argument that will convince your teacher of your answer.



IRON = ONLY 4-LETTER WORD
1D = ONLY 4-LETTER SPACE
3RD LETTER IN IRON = O = 1ST LETTER OF 3A
OXYGEN = ONLY WORD W/ 1ST LETTER "O"
5TH LETTER IN OXYGEN = E = 2ND LETTER OF 2D
HELIUM = ONLY WORD W/ 2ND LETTER "E"
SO ONLY 1 POSSIBLE SOL'N.

Examine the Venn diagram. What shape(s) can go in the intersection? Justify your statements so that they are convincing.



TRIANGLES W/ ROTATION SYMMETRY INCLUDE ALL $\boxed{\text{EQUILATERAL △s}}$ (HAVE ROTATION SYMMETRY AT 60° & 120° & 180°). NON-EQUILAT ISOSCELES △s HAVE REFLECTION SYMMETRY BUT NOT ROTATION SYMMETRY. SCALENE △s HAVE NO SYMMETRY.

ICES

ING ~△,
RTY, &
GRAMS &
LG RATIOS
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AM & IN ANSW
SITUATION
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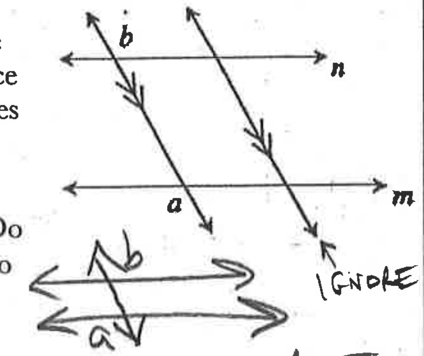
EMS & INC
SON; MP.6
R THS

$+12$

TOWER = 314
= 316

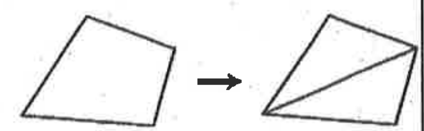
Being able to justify your thinking is especially important when you are working in a team. While you may have a correct idea, if you cannot convince your team that your ideas are valid, your teammates may not agree.

Consider the diagram at right. Assume that your teammates think $\angle a$ and $\angle b$ must be congruent. Do you agree? How can you explain your reasoning so that your team is convinced? Use a diagram to support your argument.



IF m || n THEN a = b B/C THEY ARE ALT EXT ∡s W/ || LINES. BUT ∡s a & b ARE ALONG A TRANSVERSAL CUTTING ACROSS LINES THAT ARE NOT MARKED ||, SO NO ∡ MEASURE RELATIONSHIP CAN BE KNOWN

What if someone else is trying to convince you of something? How do you think as you follow someone else's argument? Consider this as you read Lila's reasoning below. Then decide if you agree with her statement or not. If you agree, what helped convince you?



Here is my quadrilateral. ***I divided it into 2 triangles.***

"I know that the sum of the angles of a triangle is 180°, but I don't think that is true for a quadrilateral. If I draw a diagonal, I split my quadrilateral into two triangles. I know that the angles of each of these triangles add up to 180°. Therefore, I think the angles of the quadrilateral must add up to 360°."

I'M CONVINCED B/C LILA REFERRED TO PREVIOUSLY-ESTABLISHED FACTS TO JUSTIFY HER CONCLUSION. SHE COULD HAVE ELABORATED HOW THE ∡s IN △ OPPOSITE THE DIAGONAL MATCH 2 ∡s IN THE QUADRILATERAL & THE OTHER 4 ∡s'S SUM IS THE SAME AS THE SUM OF THE

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HEGEDUS

Geo A Chapter 4 Portfolio

11/4/15

Showcase your understanding of probability by solving these problems. Explain your thinking in detail.

Harold sorted his jellybeans into two jars. He likes purple ones best and the black ones next best, so they are both in one jar. His next favorites are yellow, orange, and white, and they are in another jar. He gave all the rest to his little sister. Harold allows himself to eat only one jellybean from each jar per day. He wears a blindfold when he selects his jellybeans so he cannot choose his favorites first. Show a complete sample space. What is the probability that Harold gets one black jellybean and one orange jellybean, if the first jar has 60% black and 40% purple jellybeans and the second jar has 30% yellow, 50% orange, and 20% white jellybeans?

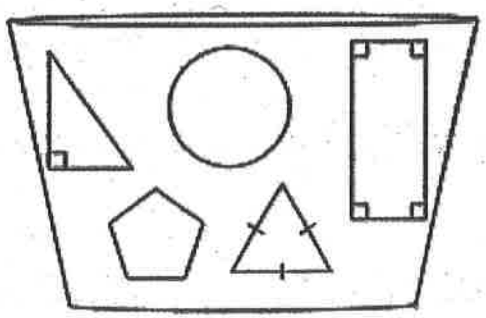
P = # PURPLE
B = # BLACK
Y = # YELLOW
R = # ORANGE
W = # WHITE

JAR 1

JAR 2	.6B	.4P
.3Y	.18	.12
.5R	.3	.2
.2W	.12	.08

$P(1B \,\&\, 1R) = 0.3 = \boxed{30\%}$

A game is set up so that a person randomly selects a shape from the shape bucket shown below. If the person selects a triangle, he or she wins \$5. If the person selects a circle, he or she loses \$3. If any other shape is selected, the person does not win or lose money. If a person plays 100 times, how much money should the person expect to win or lose? If you play this game many times, what can you expect to win (what is the expected value)? Is this game fair?



$EV = \frac{2}{5}(5) + \frac{1}{5}(-3)$

$= 2 - \frac{3}{5}$

$= \frac{10}{5} - \frac{3}{5} = \frac{7}{5} = \$1.4$

\$1.4(100) = \$140 EXPECTED WINNINGS AFTER PLAYING 100 TIMES;

GAME IS FAIR ONLY IF IT COSTS \$1.40 TO PLAY A TIME

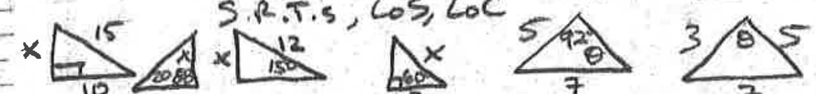
75

Name: HEGEDUS
Per: __ Date: 3/2/15 Table: __

PORTFOLIO: EVIDENCE OF MATHEMATICAL PROFICIENCY

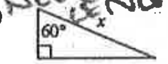
This activity will focus on choosing a strategy or tool. Think about the problems you have worked on in this chapter. When did you need to think about what method you would use to solve a problem? What helped you decide how to approach a problem? Were there times when more than one strategy seemed most useful? You may want to flip through the chapter to refresh your memory about the problems that you have worked on and discuss them with a classmate.
Once your discussion is complete, think about the way you think as you answer the questions below.

a. List all the triangle tools that you have learned so far in this course. For each tool, find or create a problem that can be solved with this strategy. P.T., △ SUM, TRIG, S.R.T.s, LoS, LoC



b. Sometimes, the key to being able to choose a strategy or tool is to recognize that different tools can be used on the same problem, but that sometimes some tools are more efficient than others.

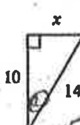
Solve for x in each diagram below *twice*. Each time, use a different strategy or tool. Then decide which method was easiest for that problem or state that both methods were of equal value.

(1) 

CAN'T DO, NEED A SIDE LENGTH.

30-60-90 : x =

TRIG: x =

(2) 

P.T.: EASIEST

$x = \sqrt{14^2 - 10^2}$

$x = \sqrt{196}$

$x = \sqrt{16}\sqrt{6}$

$x = 4\sqrt{6}$

$\boxed{x \approx 9.80u}$

TRIG (& INV TRIG):

$\cos\theta = \frac{10}{14}$

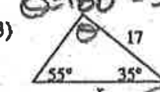
$\theta = \cos^{-1}(\frac{10}{14})$

$\theta \approx 44.4^\circ$

$\tan\theta = \frac{x}{10}$

$x = 10\tan(\cos^{-1}(\frac{10}{14}))$

$\boxed{x \approx 9.80u}$

(3) 

△ SUM: $\theta = 180^\circ - 55^\circ - 35^\circ = 90^\circ$

TRIG: EASIEST

$\cos 35^\circ = \frac{17}{x}$

$x = \frac{17}{\cos 35^\circ} \approx \boxed{20.75u}$

LoS: $\frac{\sin 55^\circ}{17} = \frac{\sin 90^\circ}{x}$

$x = \frac{17 \sin 90^\circ}{\sin 55^\circ}$

$x \approx 20.75u$

EGEDUS

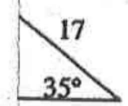
hree
as far.

LoC, △ sum
LoS, △ sum

different
efficient

methods

$\theta = 180^\circ - 55^\circ - 35^\circ = 90^\circ$



$\frac{\sin 55^\circ}{17} = \frac{\sin 90^\circ}{x}$

$\frac{17 \sin 90^\circ}{\sin 55^\circ} \approx 20.7$

$\cos 35^\circ = \frac{17}{x}$

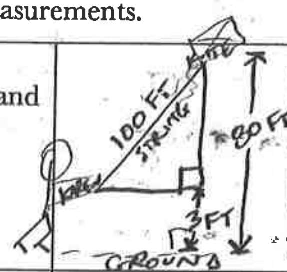
$\frac{17}{\cos 35^\circ} \approx 20.75$

EASIEST

PORTFOLIO: EVIDENCE OF MATHEMATICAL PROFICIENCY

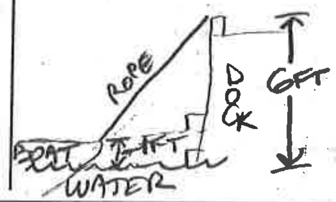
Visualization is required when you imagine a situation and want to draw a diagram to represent it. Read the descriptions below and visualize what each situation looks like, then draw a diagram for each. Label your diagrams appropriately with any given measurements.

a. Karen is flying a kite on a windy day. Her kite is 80 feet above ground and her string is 100 feet long. Karen is holding the kite 3 feet above ground.



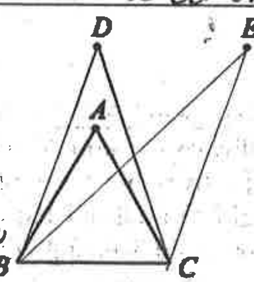
SO, RT △ HAS SIDES LENGTH 100 FT, 80-3 = 77 FT & $\sqrt{100^2-77^2} \approx 63.80$ FT
THE STRING MAKES AN ∡ OF $\tan^{-1}\left(\frac{77}{63.80}\right)$ ≈ 50.4° W/ HORIZONTAL

b. The bow of a rowboat (which is 1 foot above water level) is tied to a point on a dock that is 6 feet above the water level.



SO, RT △ HAS h = 5 FT, BUT DON'T KNOW OTHER m∡s OR SIDE LENGTHS

Sometimes, visualization requires you to think about how an object can move in relation to others. For example, consider equilateral ΔABC at right.



c. Visualize changing ΔABC by stretching vertex A to point D, which is directly above point A. What does the new triangle look like? Do you have a name for it?

LOOKS LIKE AN ISOSCELES △. ORIGINALLY, IN △ABC, AB = BC = AC; NOW, IN △DBC, DB = DC.

d. What happened to $m\angle A$ as you stretched the triangle in part c? What happened to $m\angle B$ and $m\angle C$?

∡A MAPPED ONTO ∡D & m∡D < m∡A; m∡s B & C INCREASED

e. Now visualize the result after vertex A stretched to point E. What type of triangle is the result? What happens to $m\angle B$ as the triangle is stretched? What happens to $m\angle C$?

SCALENE: EB ≠ BC, EB ≠ EC & BC ≠ EC; m∡B DECREASES, WHILE m∡C INCREASES (IE, m∡EBC <

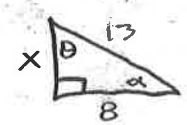
Geo A Ch 5 Portfolio Name: HEGEDUS

Think about the way you think as you answer the questions below.

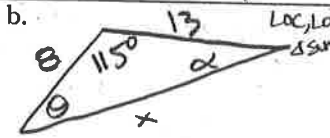
1. List all the triangle tools that you have learned so far in this course. Create three different problems that can be solved using three of the strategies learned thus far.

List: PYTHAG THM, TRIG & INV. TRIG, SPECIAL RT △, LOS, LOC, △ SUM

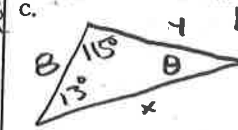
a. PT & INV TRIG, & △ SUM



b. LOC, LOS, △ SUM



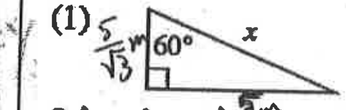
c. LOS, △ SUM



2. Sometimes, the key to being able to choose a strategy or tool is to recognize that different tools can be used on the same problem, but that sometimes some tools are more efficient than others.

Solve for x in each diagram below *twice*. Each time, use a different strategy or tool. Then decide which method was easiest for that problem or state that both methods were of equal value.

(1)



30°-60°-90°:

$x = \frac{2 \cdot 5}{\sqrt{3}} = \frac{10}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \boxed{\frac{10\sqrt{3}}{3}}$ m

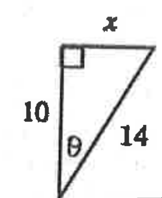
EASIEST

TRIG:

$\frac{x(\sin 60^\circ)}{\sin 60^\circ} = \frac{\left(\frac{5}{x}\right)x}{\sin 60^\circ}$

$x = \frac{5}{\sin 60^\circ} \approx \boxed{5.77 \text{ m}}$

(2)



PT: $x = \sqrt{14^2 - 10^2}$

$x = \sqrt{196-100}$

$x = \sqrt{96} = \sqrt{16} \cdot \sqrt{6}$

$x = 4\sqrt{6} \approx \boxed{9.80\text{ u}}$

EASIEST

TRIG (& INV TRIG):

$\cos\theta = \frac{10}{14} \rightarrow \theta = \cos^{-1}\left(\frac{10}{14}\right)$

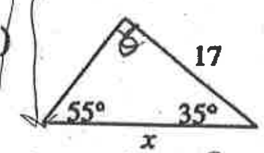
$[\theta \approx 44.4^\circ]$

$\tan\theta = \frac{x}{10} \rightarrow x = 10\tan\theta$

$x = 10\tan\left(\cos^{-1}\left(\frac{10}{14}\right)\right) \approx \boxed{9.80\text{ u}}$

(3)

△ SUM: θ = 180° - 55° - 35° = 90°



LOS: $\frac{\sin 55^\circ}{17} = \frac{\sin 90^\circ}{x}$

$x = \frac{17\sin 90^\circ}{\sin 55^\circ} \approx \boxed{20.75\text{ u}}$

TRIG: $\cos 35^\circ = \frac{17}{x}$

$x = \frac{17}{\cos 35^\circ} \approx \boxed{20.75\text{ u}}$

EASIEST

Visualization is req
diagram to repre
each situation loc
diagrams approp

a. Karen is flyin
day. Her kit
her string is
holding the k

b. The bow of
above water
dock that is

Sometimes, visu
object can mov
equilateral ΔAB

c. Visualize c
D, which is
triangle loo

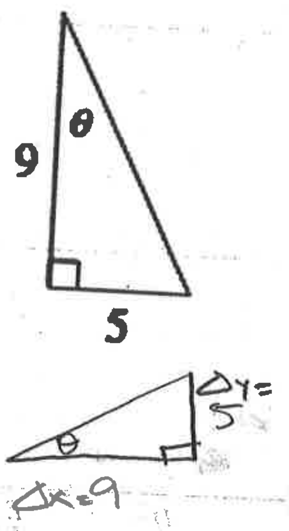
d. What happ
$m\angle B$ and m

e. Now visua
result? Wh

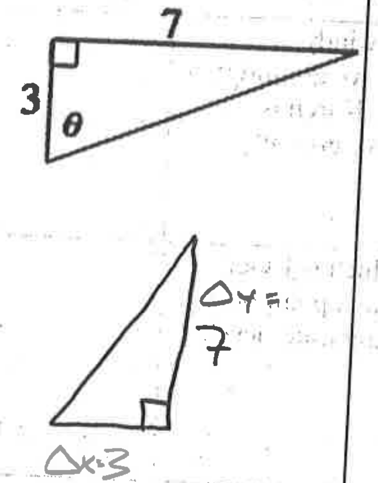
Name: HEGEDUS

An important use of visualization is to re-orient a right triangle to help you identify which leg is Δx and which leg is Δy. For each triangle below, visualize the triangle by rotating and/or reflecting it so that it is a slope triangle. Draw the result and label the appropriate legs Δx or Δy.

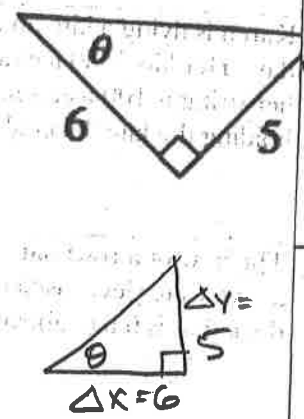
f.



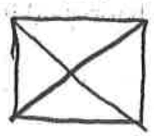
g.

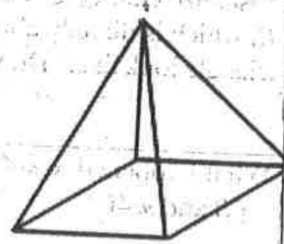


h.



Finally, visualization can help you view an object from different perspectives. For example, consider the square-based pyramid at right. Visualize what you would see if you looked down at the pyramid from a point directly above the top vertex. Draw this view below.





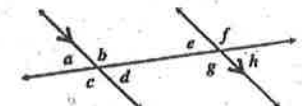
ant use of vis
id which leg
ecting it so t
Δy.

5

isualization can
ves. For examp
Visualize what
nid from a poin
below.

c. While you have focused most of this chapter on developing strategies for measuring triangles, you have developed strategies for several other topics so far in this course. Consider your strategy options as you answer the questions below.

(1) Examine the diagram at right. Assume you know the measure of $\angle b$. How could you find $m\angle h$? Describe two different strategies.



① B/C LINES ARE ∥, CORRESP ∡s ARE ≅ SO f=b
f & h FORM A STRAIGHT ∡, AKA, A LINEAR PR. & SO ARE SUPPLEMENTARY: f+h=180°. SUBSTITUTE b FOR f: b+h=180°

$$\begin{aligned} b+h&=180^\circ\\ -b\quad &\quad -b\\ h&=-b+180^\circ\end{aligned}$$

② ∥ → AIAs ≅ → b=g; STRAIGHT ∡ PR → g+h=180°
SUBST b FOR g: b+h=180°

$$\begin{aligned} b+h&=180^\circ\\ -b\quad &\quad -b\\ h&=180^\circ-b\end{aligned}$$

(2) Now consider the trapezoid below. Find the area of the shape twice, using two different strategies.

① $A=\frac{1}{2}(b_1+b_2)h=\frac{1}{2}(20+12)(6)=\boxed{96u^2}$

② $A=\frac{1}{2}(20)(6)+\frac{1}{2}(12)(6)=96u^2$

Ge

a.

2. S
to
th

to
w

(1)

30°

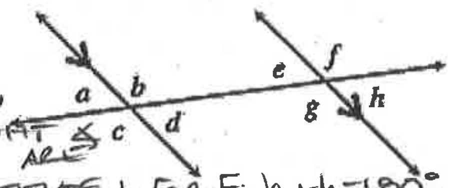
X=

TRIG
Xsin

X

3. While you have focused most of this chapter on developing strategies for measuring triangles, you have developed strategies for several other topics so far in this course. Consider your strategy options as you answer the questions below.

a. Examine the diagram at right. Assume you know the measure of $\angle b$. How could you find $m\angle h$? Describe two different strategies.



① B/C LINES ARE ||, CORRESP ∡s ARE ≅, SO $f=b$. f & h FORM A STRAIGHT ∡ (AKA, A LINEAR PAIR) & SO ARE SUPPLEMENTARY ∴ $f+h=180°$. SUBSTITUTE b FOR F: $b+h=180°$
$-b \qquad -b$
$\boxed{h=-b+180°}$

② B/C LINES ARE ||, AIAs ARE ≅, SO $b=g$. g & h ARE SUPP B/C THEY FORM A STRAIGHT ∡, SO $g+h=180°$
SUBST b FOR g: $b+h=180°$
$-b \qquad -b$
→ $\boxed{g=180°-b}$

b. While shopping at the Two Tired Bike Shop, Barry notices that he may choose from many bicycles. Of the bikes at the store, ¼ were mountain bikes, while the rest were racing bikes. Also, ½ of the bikes were blue, ⅓ of the bikes were red, and ⅙ of the bikes were purple. Barry decides that he will randomly choose a bicycle from the store.

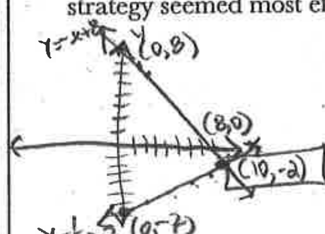
Choose a probability model to represent this situation. Then find the probability that he chooses a purple racing bike.

TYPE \ COLOR	B $\frac{1}{2}$	R $\frac{1}{3}$	P $\frac{1}{6}$
M $\frac{1}{4}$	BM $\frac{1}{8}$	RM $\frac{1}{12}$	PM $\frac{1}{24}$
R $\frac{3}{4}$	BR $\frac{3}{8}$	RR $\frac{1}{4}$	PR $\frac{1}{8}$

$P(P,R) = \boxed{\frac{1}{8}}$

4. What about multiple strategies that you have learned in an earlier class? For example, you have multiple ways to approach a problem involving a system of equations. Consider the system at right. Solve the system *twice*: once by graphing and again algebraically. Which strategy seemed most efficient? Why?

$$y = -x + 8$$
$$y = \tfrac{1}{2}x - 7$$



$2(-x+8)=(\tfrac{1}{2}x-7)2$

$-2x+16 = x-14$
$+2x+14 \quad +2x+14$

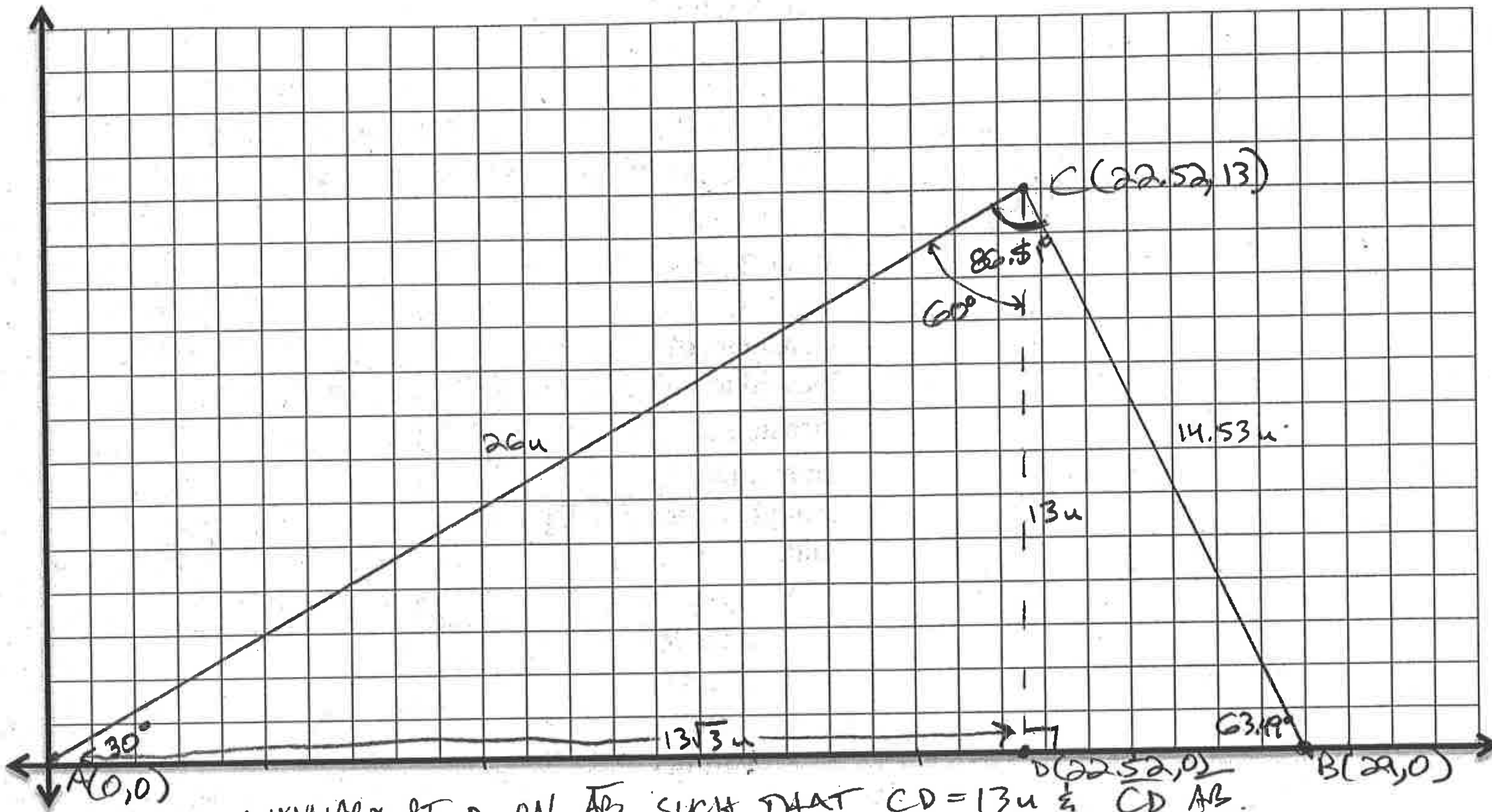
$\frac{30}{3}=\frac{3x}{3} \rightarrow x=10$

$y=-(10)+8=-2$

$\boxed{(10,-2)}$

ALG MORE PRECISE / LESS WORK

Show your work!



$A\ (0, 0)$

$B\ (29, 0)$

$C\ (\underline{22.52}, \underline{13})$

$m\measuredangle A = 30°$

$m\measuredangle B = 63.49°$

$m\measuredangle C = 86.51°$

$AB = 29$ u

$BC = 14.53$ u

$CA = 26$ u

$h = 13$ un.

Area = $188.5\,u^2$

Perimeter = 69.53 u

Work space

- AUXILIARY PT D ON $\overline{AB}$ SUCH THAT $CD = 13u$ & $\overline{CD}$ $\overline{AB}$.
- $\triangle ADC$ IS A $30°$-$60°$-$90°$ SO $AC = 26u$ & $AD = 13\sqrt{3}\,u \approx 22.52 \rightarrow C(22.52, 13)$
- P.T.: $BD^2 + CD^2 = BC^2 \rightarrow BC = \sqrt{(29-13\sqrt{3})^2 + 13^2} \approx 14.53u$
- $A = \frac{1}{2}(29)(13)$ • $P = AB + BC + CA \approx 29 + 14.53 + 26$
- $\dfrac{\sin m\measuredangle C}{29} = \dfrac{\sin 30°}{\sqrt{(29-13\sqrt{3})^2+13^2}}$

  $m\measuredangle C = \sin^{-1}\left(\dfrac{29 \sin 30°}{\sqrt{(29-13\sqrt{3})^2+13^2}}\right) \approx 86.51°$
- $m\measuredangle B \approx 180° - 30° - 86.51° \approx 63{,}49°$