A Perfect Number (28) of Activities for the Math Classroom

Gregory Fisher, Mt. Tabor High School,
Winston-Salem, NC, gsfisher@wsfsc.k12.nc.us
http:www.wsfcs.k12.nc.us/Domain/798

Fred Thompson, East Forsyth High School,
Kernersville, NC, fgthompson@wsfcs.k12.nc.us

Greg:

- Davidson College graduate many years ago (Mascot)
- Has taught math, Japanese, and ESL in middle schools and high schools in five countries.
- NBCT and Burroughs Wellcome Fund Career Award in Science and Mathematics Teaching Award recipient.

Fred

- Former Engineer and Entrepreneur
- University of Maine graduate

Amigo Bingo (1)

24	5	7	18	11
23	4	2	10	12
14	3	Free	1	13
15	16	17	9	20
22	6	8	19	21

Runner or Normal Bingo (2)

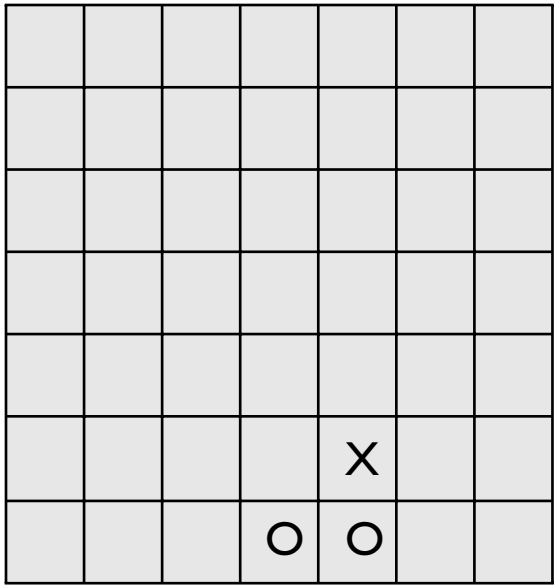
24	5	~~7~~ A	18	11
23	4	2	10	12
14	3	Free	1	13
15	16	17	9	20
22	6	8	19	21

1: 32
2: All Real Numbers
3: $y > 3$
4: 26
5: Octagon
6: $180 (n - 2)$
7: 16
8: $3x + 2$
9: $3(x + 2)$
etc…
29: $5x$
30: No solution

A. What is $(-4)^2$

B. Simplify $3x + 2x$

Four in a Row (5)

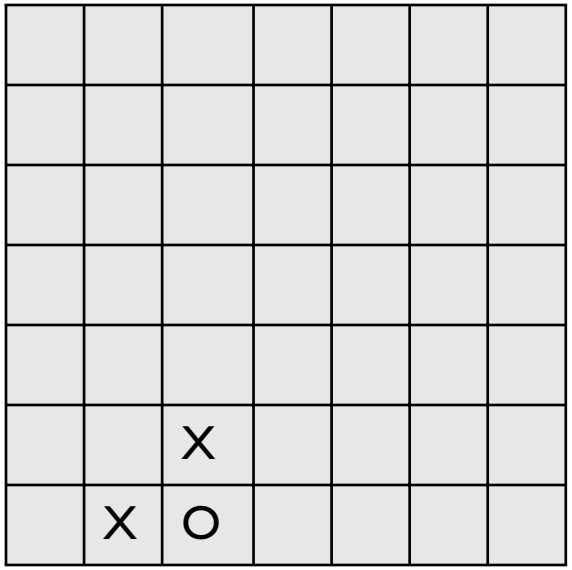


X?: What is 2 + 2 X: 2 O: 4 O goes

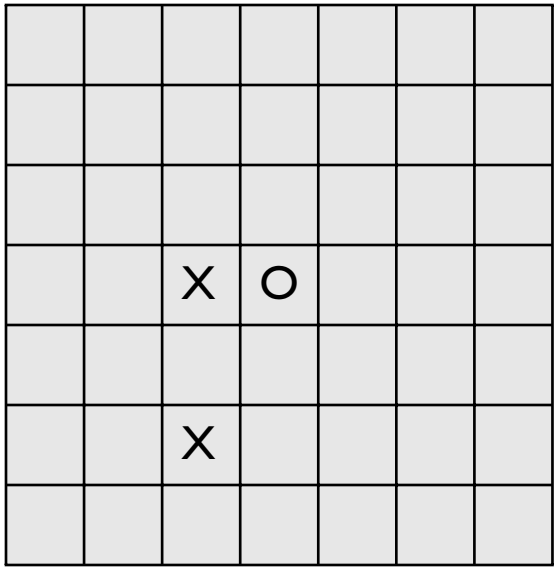
O?: What is 3 + 2 X: 4 O: 5 O goes

X?: What is 4 + 2 X: 6 O: 6 X goes

(x question)



With "gravity"



Without "gravity"

Bluff (6)

Geniuses Cockroaches Euclid Pythagoras

Slap Jack (7)

Rules for SlapJack

1) **First person to touch a correct rectangle gets 2 pts.**
2) **Anyone touching an incorrect rectangle loses 1 pt.**
3) **Anyone touching a correct rectangle on first try (but not the first to touch gets 1 pt.)**
4) **Each group monitors themselves and determines the points per individual. Person with fewest letters in last name keeps score.**
5) **No whining and no writing on the sheet!**

2(x-3)=2x-6 **A**	**(a + 3) + 4 = a + (3 + 4)** **B**	**5*a*b = 5*b*a** **C**	**(5 + 4) + 2 = (4 +5) + 2** **D**
-6 + 6 = 0 **G**	5 + 0 = 5 H	6* 1=6 I	2 (1/2) = 1 J
5+x = 6 → **5+-5+x = 6 + -5** **M**	2x = 6 2(1/2)x = 6(1/2) N	0*5 = 0 O	5*(3*2)=(5*3)*2 P

$Y = (1.056)^x$ **A**	**Neither** **B**	**2** **C**	**5% increase** **D**	**7** **E**	**$Y = 6(1.4)^x$** **F**
56 **G**	50% increase H	Growth I	$6(1.04)^x$ J	Decay K	30% decrease L
132 **M**	37% increase N	$6(.96)^x$ O	3% decrease P	3.7% increase Q	$Y = (1.56)^x$ R

Grumble (8)

Complain for 30 seconds. If you can't think of anything to complain about then just say "Grumble."

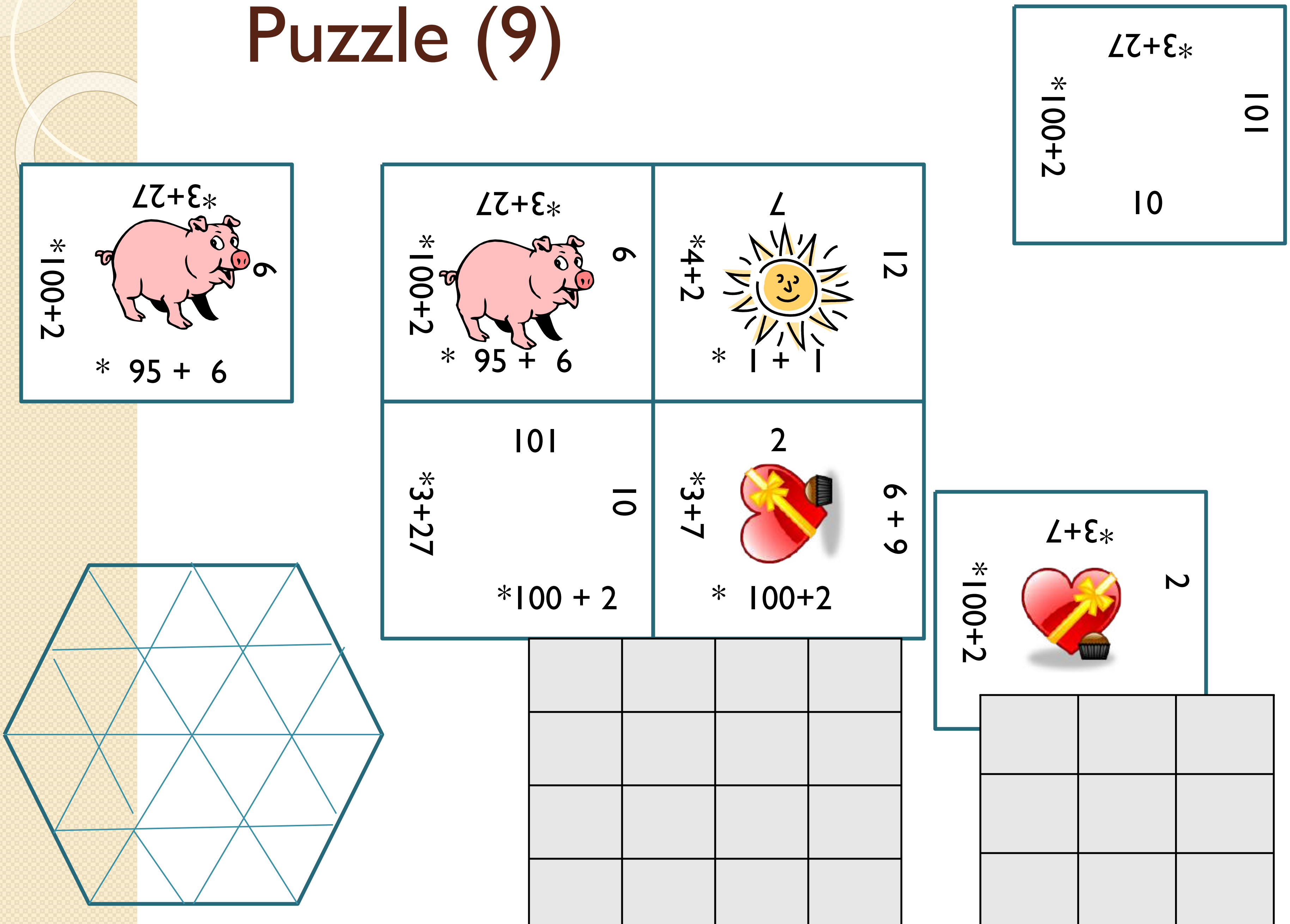
Use for finding mean, median, mode etc….

Use for rate of change or linear regression

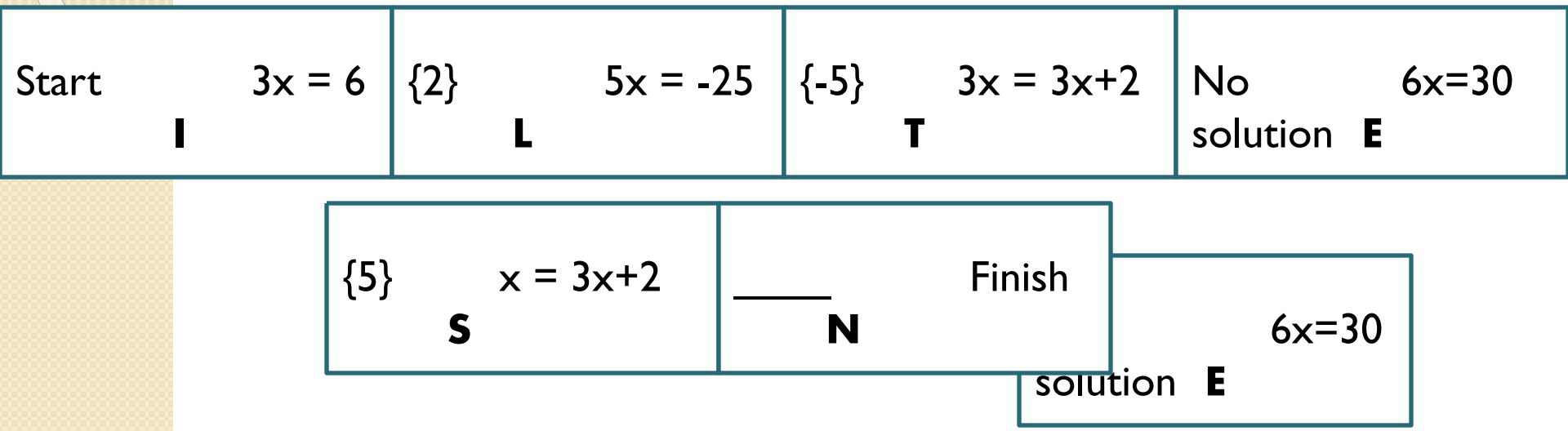
Time	Grumbles
30	8
40	12
50	18

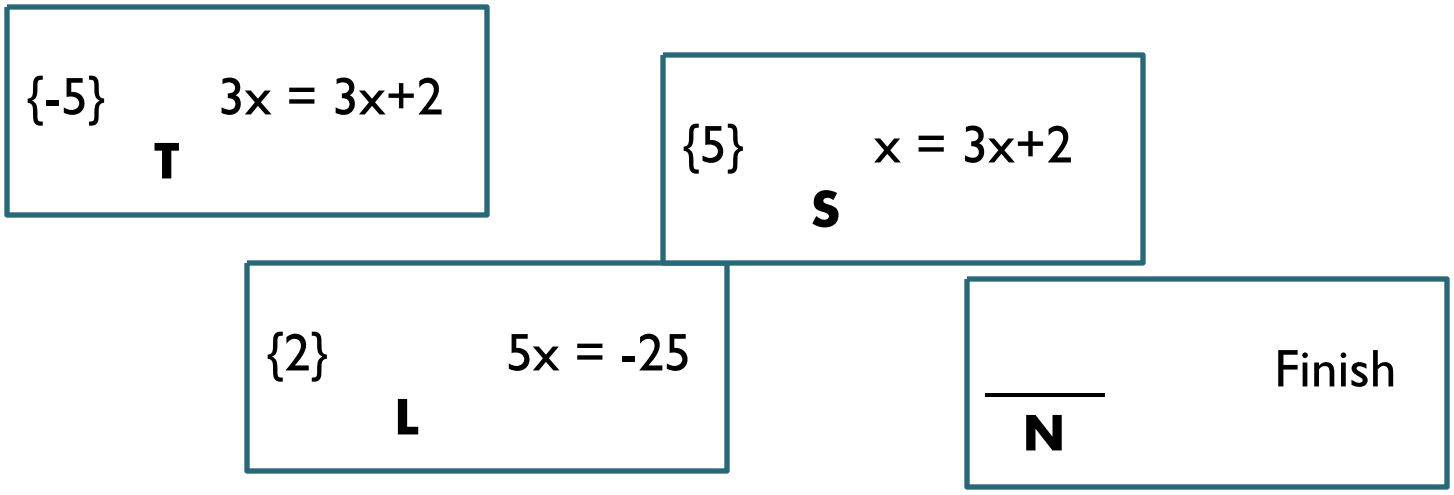
TARSIA and http://www.mrbartonmaths.com/jigsaw

Puzzle (9)



Dominoes (10) <Not the pizza>

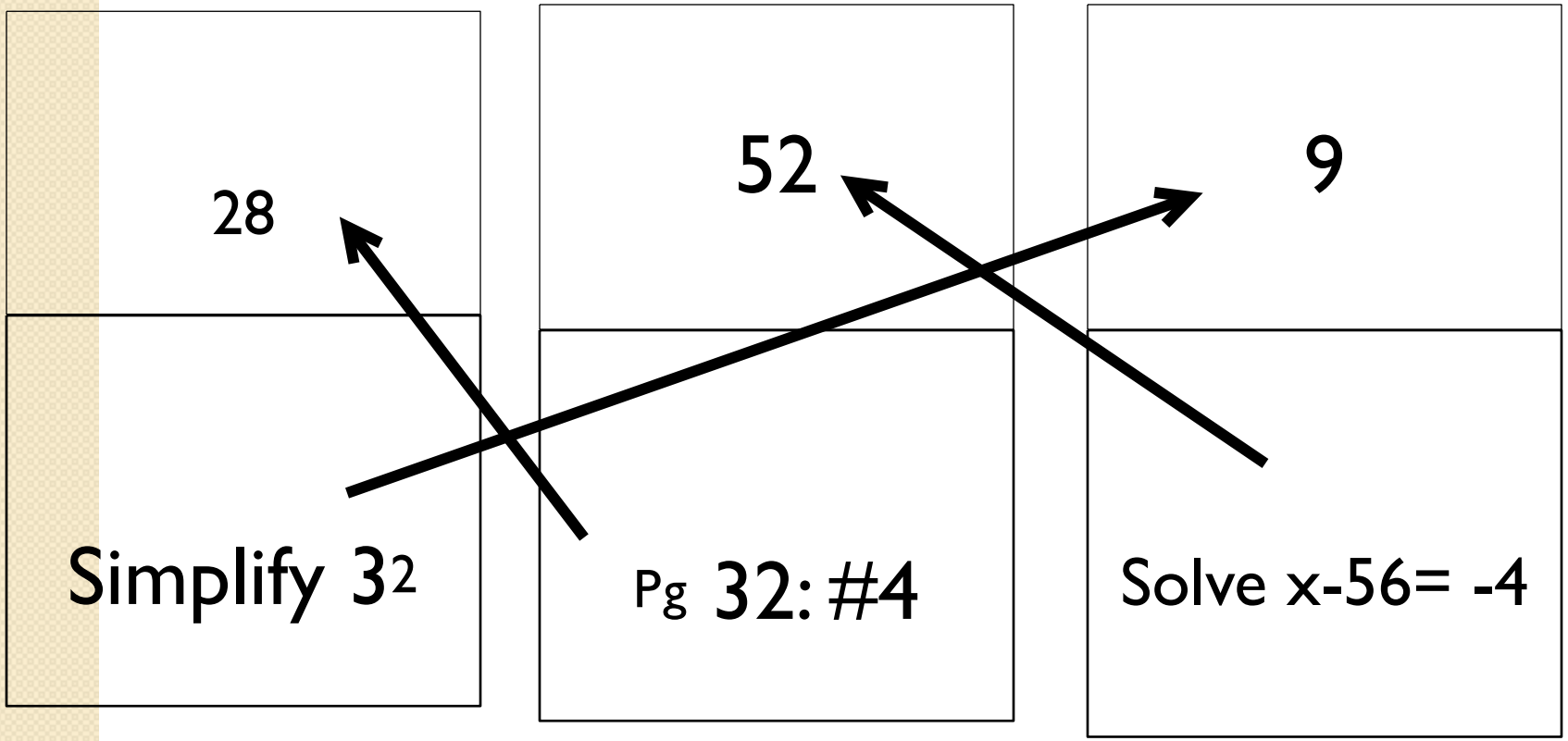




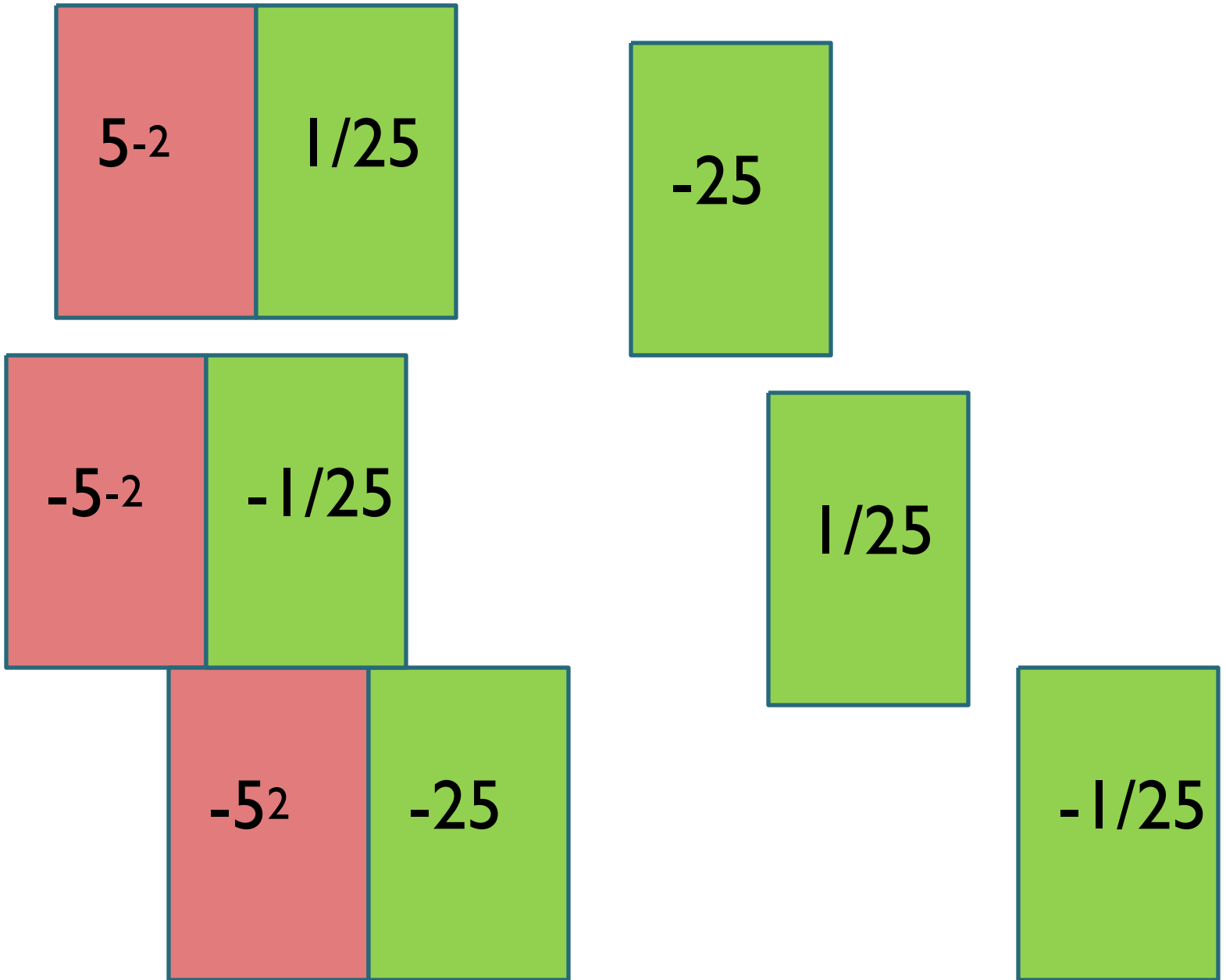
Dominoes (10) <Not the pizza>

$2x^{\frac{5}{2}}y^{\frac{1}{2}}$ **C** $\sqrt[3]{27x^{12}y^{5}}$	$3x^{4}y^{\frac{5}{3}}$ **G** $\sqrt{64x^{2}y^{3}}$	——— **L** $\sqrt{9x^{6}y^{4}}$
$3x^{3}y^{2}$ **F** $(16x^{5}y)^{\frac{1}{2}}$	$4x^{\frac{5}{2}}y^{\frac{1}{2}}$ **M** $(8x^{7}y^{2})^{\frac{1}{3}}$	$2x^{\frac{7}{3}}y^{\frac{2}{3}}$ **B** $\sqrt[3]{64x^{2}y^{3}}$
$4x^{\frac{2}{3}}y$ **I** $(9x^{5}y)^{\frac{1}{2}}$	$3x^{\frac{5}{2}}y-$ **A** $\sqrt[3]{8x^{2}y^{7}}$	$2x-y^{\frac{7}{3}}$ **D** $(9x^{3}y^{7})^{\frac{1}{2}}$
$3x^{\frac{3}{2}}y^{\frac{7}{2}}$ **E** $(64x^{5}y)^{\frac{1}{3}}$	$4x^{\frac{5}{3}}y^{\frac{1}{3}}$ **K** $(27x^{6}y^{9})^{\frac{1}{3}}$	$3x^{2}y^{3}$ **H** $\sqrt{4x^{5}y}$

Circuit (11)



Matching Cards (12)



Caleb's phone company charges a $40 flat rate and $0.10 per minute. 4

slope = 0.10
y-intercept = 40
R

NEXT = NOW + 0.10, starting at 40
33

$y = 40 + 0.10x$
25


A

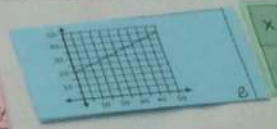
X	0	10	20	40
Y	40	41	42	

Ally's plant was 20 inches tall and grows 1 inch every 2 days. 1

slope = $\frac{1}{2}$
y-intercept = 20
S

NEXT = NOW + $\frac{1}{2}$, starting at 20
35

$y = 20 + \frac{1}{2}x$
24


B

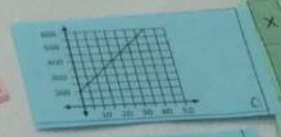
X	0	2	4	6
Y	20	21		23

Roman opened a savings account with $200 and saves $10 per month. 5

slope = 10
y-intercept = 200
U

NEXT = NOW + 10, starting at 200
33

20


C

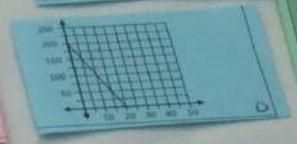
X	0	2	4	6
Y	200		240	260

Allen weighs 200 pounds but loses 10 pounds per month on his diet. 2

slope = - 10
y-intercept = 200
T

31

$y = 200 - 10x$
26


D

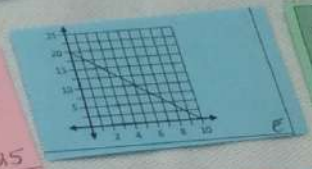
X	0		6	10
Y	200	160	140	100

Sabrina borrowed $20 from her mom and pays her back $2 each week. 7

Q

NEXT = NOW − 2, starting at 20
34

$y = 20 - 2x$
25


E

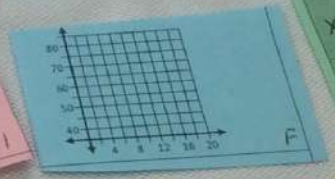
X	0	3	5	8
Y		14	10	4

Isaiah's job pays $40 per day and $3 for each sale that he makes. 6

slope = 3
y-intercept = 40
✓

NEXT = NOW + 3, starting at 40
36

$y = 40 + 3x$
21


F

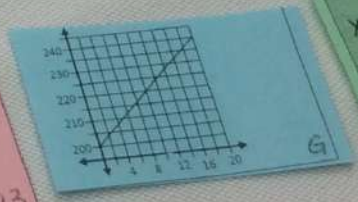
X		8	10	13
Y	55	64	70	7

3

slope = 2
y-intercept = 200
P

NEXT = NOW + 2, starting at 200
30

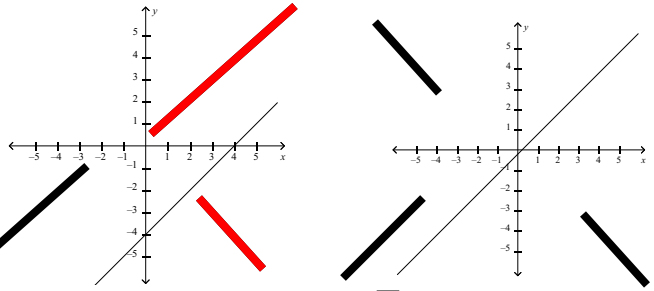
$y = 200 + 2x$
23


G

X	3	7	
Y	206	214	

Listening Tree (13)

START



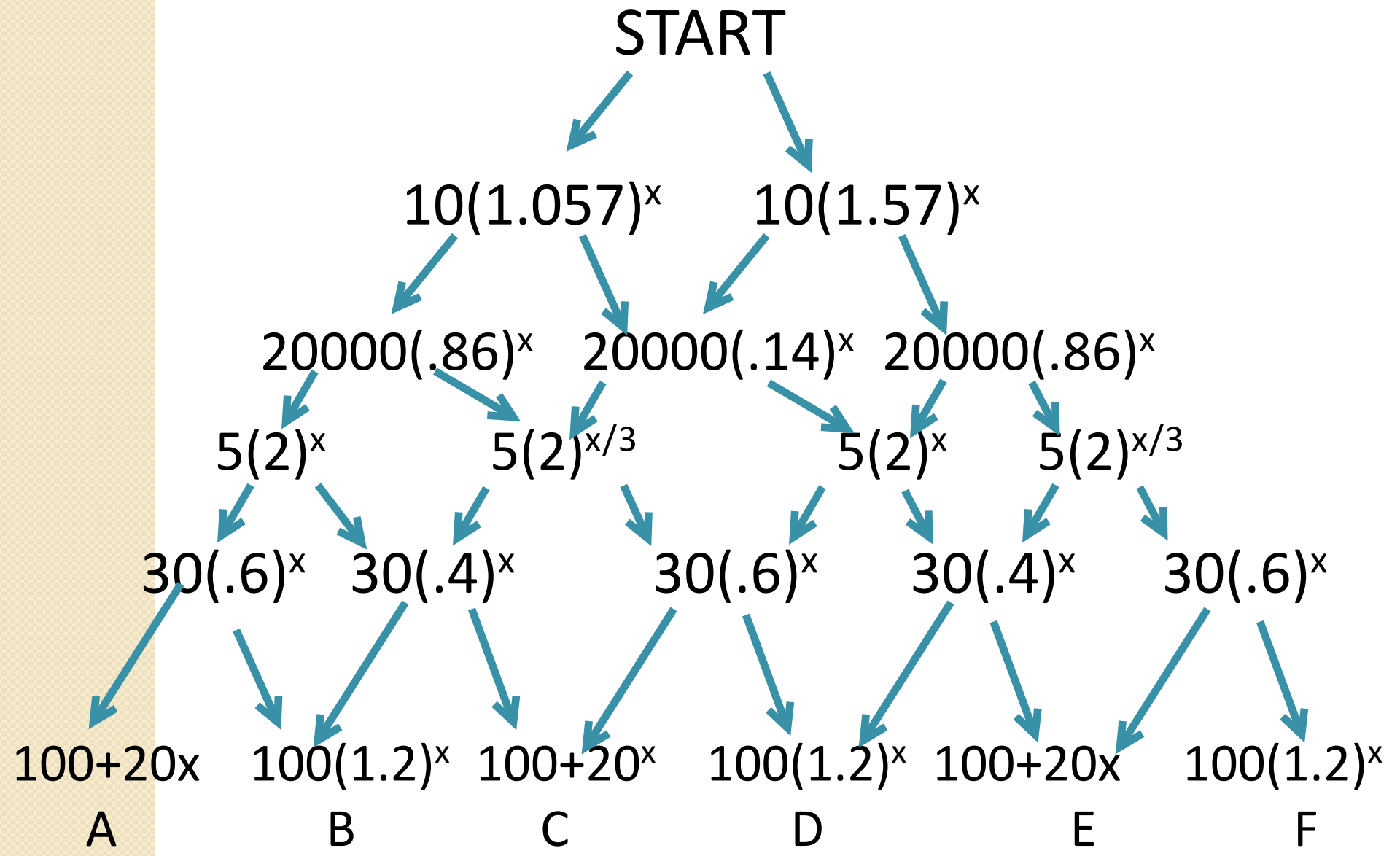
5 - n n - 5 5 - n

3n + 6 3(n + 6) 3n + 6 3(n + 6)

$8x^5$ $8x^6$ $8x^5$ $8x^6$ $8x^5$

1 2 3 4 5

Listening Tree (13)



Fisher Says (14)

If I say "Fisher Says" then model what I say
If I don't say "Fisher Says" then "Freeze!!!"

(-3,4)

(2,0)

$y = x$

$y = 3$

$x = 3$

$y = x + 1$

$y = 4x + 3$

$y = 2x - 1$

Vocabulary Recall (15)

You say your card and then someone else's card. Then that person says his card and then someone else's….

Fish	Pig
Cat	Teacher

Vocabulary Recall (15)

Pythagorean Theorem

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

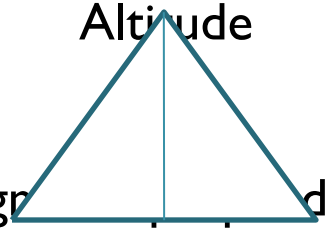
Midpoint

x2 + x1 Enter divided by 2, y1 + y2 enter divided by 2

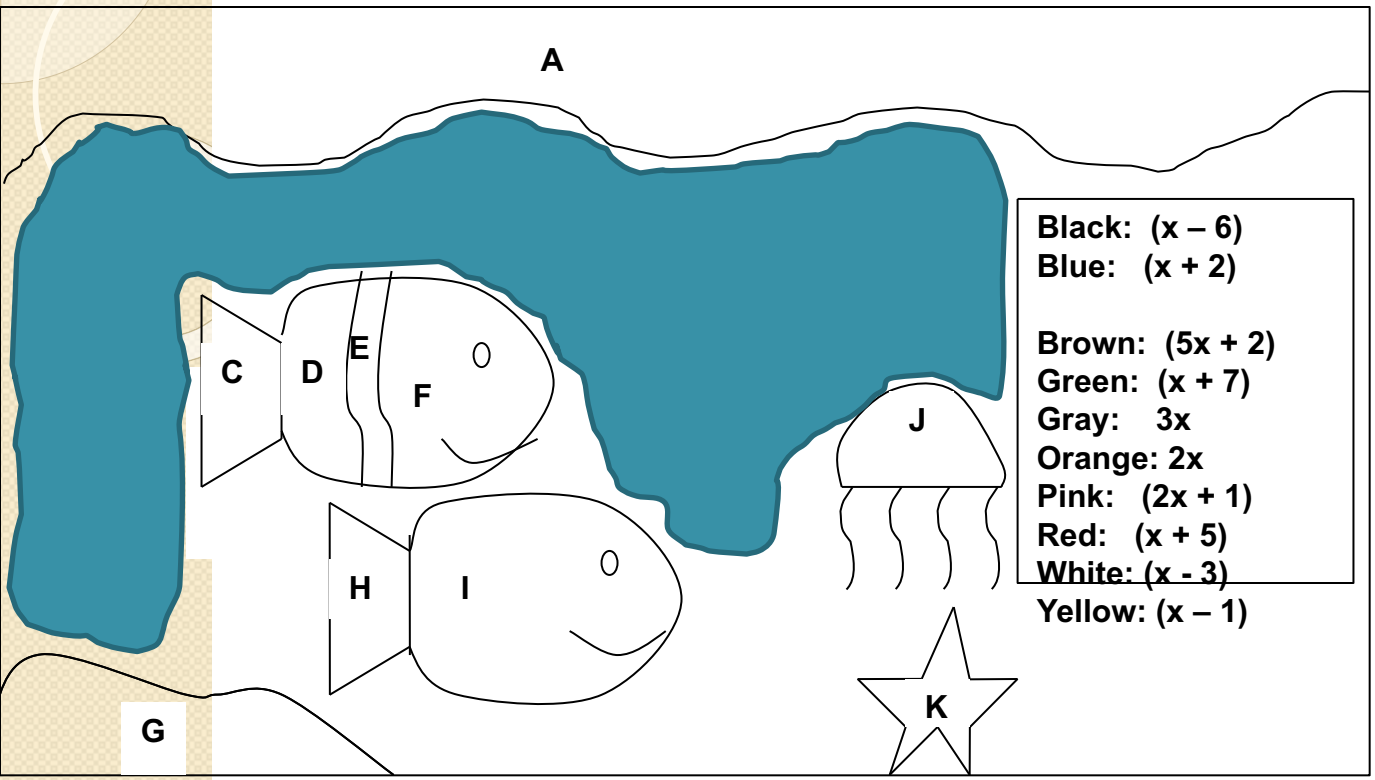
Volume of a Pyramid

V=(1/3)Bh

Altitude



Segment perpendicular to opposite side from vertex



B	$x^2 + 6x + 8$	$(x + 4)(x + 2)$	**Blue**

Color by Number for Factoring (16)

Partner Activity (17)

Set 1A

1. $2x = 4$
2. $5x = -10$
3. $4x = 16$
4. $8x = -24$

1. 2
2. -2
3. 4
4. -3

Set 1B

A. $9x = 36$
B. $4x = -12$
C. $8x = 16$
D. $10x = -20$

A. 4
B. -3
C. 2
D. -2

1-C 2-D 3-A 4-B

Set 2A

5.
6.
7.
8.

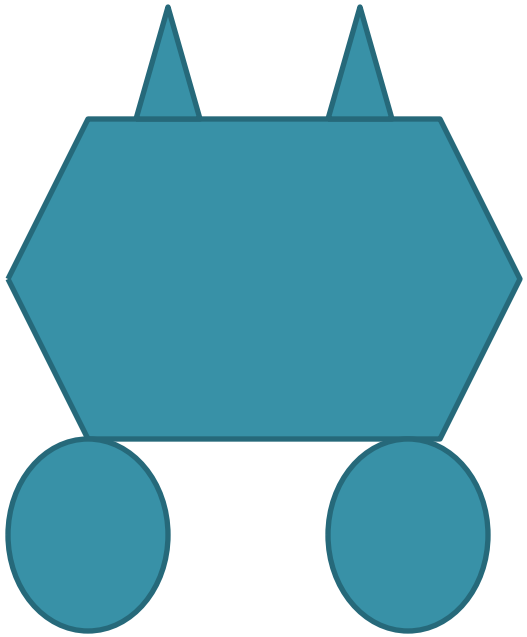
Set 2B

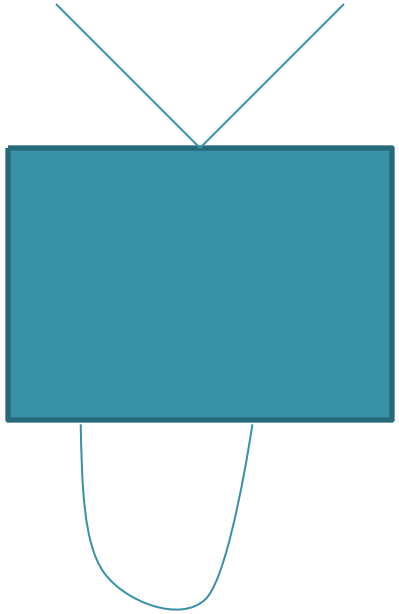
I.
J.
K.
L.

Examples on slope, exponents, and easy rational can be found in the handout

Slope	Pair #1	Pair #2	Pair #3
5	(1, 6) and (2, 11)	(-2, -3) and (0, 7)	**(4, 8) and (7, 23)**
2/3	(-1, -8) and (5, - 4)	(5, 6) and (8, 8)	**(-4, 1) and (-13, -5)**
-1/7	(0, 3) and (14, 1)	(3, -2) and (-11, 0)	**(2, 4) and (9, 3)**
0	(8, 12) and (4, 12)	(5, -2) and (-3, -2)	**(-1, 5) and (10, 5)**
Undefined	(3, 8) and (3, 0)	(-2, 6) and (-2, -2)	**(0, 7) and (0, 2)**
9/5	(3, 6) and (13, 24)	(-3, -8) and (2, 1)	**(-7, 8) and (-2, 17)**
- 6	(2, -8) and (-1, 10)	(-3, -15) and (-5, -3)	**(4, 9) and (6, -3)**
-7/6	**(5, 12) and (11, 5)**	**(-3, 8) and (3, 1)**	**(-7, -7) and (5, -21)**

Describe the Picture (18)





Unlimited Problems (19)

Create problems (mult. and exponent power) with solution of $15x^2y^3$

Example:

ANSWER: $15x^2y^3$ with mult. of variables & bonus for using the power rule of exponents

Group 1

a) $5xy^3$ (3x) 0 pt (same)
b) $3x(5y^3)(x)$ 1 pt
c) $\frac{1}{2}(30x^2y^2)(y)$ 1 pt
d) $3(5x)(y^3)$ -1 pt (incorrect)
e) $(5xy)^2y$ 2 pts (bonus)
f) $3*5*x*x*y*y*y$ 1 pt

Total 4pts

Group 2

a) $15x^2*y^3$ 1pt
b) $5*3*x*y*y^2$ 1pt
c) $12 + 3x^2y^3$ -1 pt (incorrect)
d) $5xy^3(3x)$ 0 pt (same)
e) $3x^2y^3 + 12x^2y^3$ 0 pt

Total 1 pt

Partner Relay (20.5)

Left person: Solve for x: $x + 2 = 7$

Right Person: Solve for y: $2x - y = 8$

(x is what you get from your partner)

Left person: Solve for x: $3x + 4 = -11$

Right Person: Solve for y: $2x-y = 25$

(x is what you get from your partner)

Right person: Solve for x: $-3x + 4 = -20$

Left Person: Solve for y: $2x-3y = 25$

(x is what you get from your partner)

Partner Relay (20.5) (One person is L(x) and the Other is R(x)

$L(x) = -5x - 2$ $R(x) = x^2 - 6x + 7$

L o R(3) $= L(R(3)) = L(3^2 - 6(3) + 7)$

$= L(-2) = -5(-2) - 2 = 8$

R(L(2)) $= R(-5(2) - 2) = R(-12) =$

$(-12)^2 - 6(-12) + 7 = 223$

L o R(x) $L(R(x) = L(x^2 - 6x + 7)$

$= -5(x^2 - 6x + 7) - 2$

$= -5x^2 + 30x - 35 - 2$

$= -5x^2 + 30x - 37$

Human Number Line (27)

Have the students arrange the cards (or themselves) from smallest to largest…

Example

-4^2	$(-4)^2$	$3(2)^2$	$-3-5$
3.14	Pi	$8-3$	$-4+5$
$1+1+1+1+1+1+1*0$			

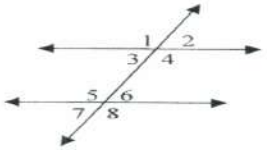
Give-one Take-one (28)

Give-One Get-One

Angle Relationships

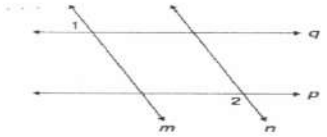
1. What is $m\angle x$?

5. Name the angle relationships.



$\angle 1$ & $\angle 2$
$\angle 5$ & $\angle 8$
$\angle 5$ & $\angle 4$
$\angle 8$ & $\angle 4$

9. Given: $p \parallel q$;
$m \parallel n$;
$m\angle 1 = 75°$

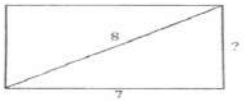


What is $m\angle 2$?

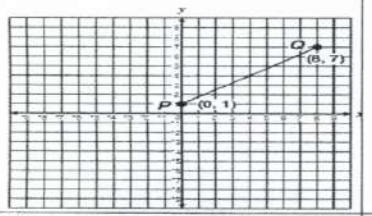
A 15°
B 75°
C 90°
D 105°

Pythagorean Theorem

2. What is the height of this rectangle?



6. What is the length of line segment $\overline{PQ}$ shown below?

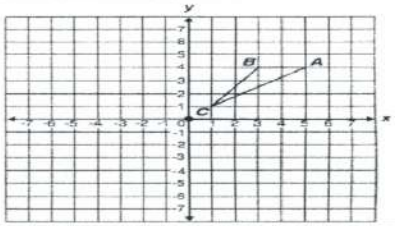


10. A right triangle's hypotenuse has length 5. If one leg has length 2, what is the length of the other leg?

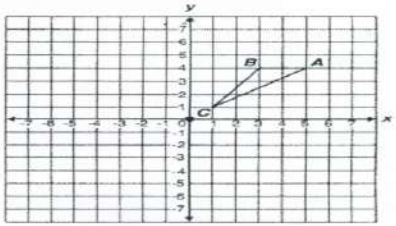
A 3
B $\sqrt{21}$
C $\sqrt{29}$
D 7

Transformations

3. If triangle ABC is rotated 180 degrees about the origin, what are the coordinates of A'?

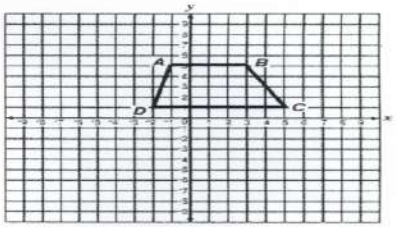


7. Reflect triangle ABC across the x-axis.



11. Trapezoid $ABCD$ below is to be translated to trapezoid $A'B'C'D'$ by the following motion rule.

$$(x, y) \rightarrow (x + 3, y - 4)$$

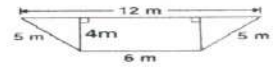


What will be the coordinates of vertex C'?

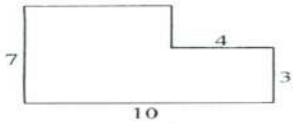
A $(1, -3)$
B $(2, 1)$
C $(6, 1)$
D $(8, -3)$

Area of Figures

4. What is the area, in square meters (m), of the trapezoid shown below?



8. What is the area of the figure?



12. The rectangle shown below has length 20 meters and width 10 meters.

If four triangles are removed from the rectangle as shown, what will be the area of the remaining figure?

A 136 m²
B 144 m²
C 168 m²
D 184 m²

Residuals

Name	Guessed Age	Actual Age	Residual or Percent of Error |Predicted-Actual|
1. Miley Cyrus		22	
2. President Obama		53	
3. Leonardo DiCaprio		41	
4. Kim Kardashian		34	
5. Queen of England		88	
		Total:	

Factoring Binomials (Sung to "If you are happy and you know, clap your hands")

(+ +) = (+)(+) (- +) = (-)(-)

If the second is a plus, two of the first.
If the second is a plus, two of the first.
If the second is a plus, then you add to get the middle
If the second is a plus, two of the first

(+ -) = (+)(-)

If the second is a minus, one of each
If the second is a minus, one of each
If the second is a minus, then you subtract to get the middle
If the second is a minus, one of each.

Shifting Graph (Sung to "We wish you a Merry Christmas")

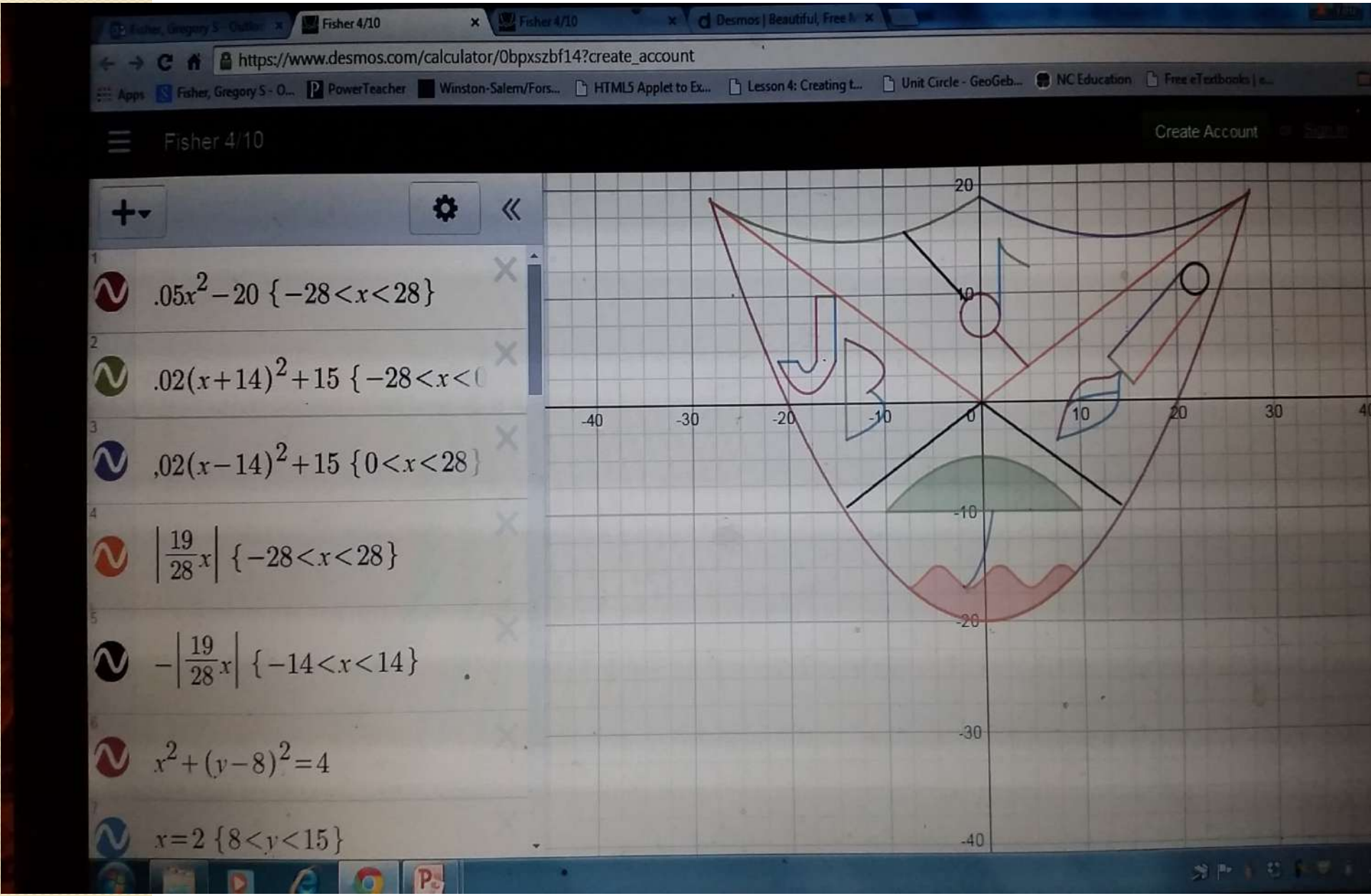
A plus in the middle moves it left
A plus in the middle moves it left
A minus in the middle mores it right
That how you move horizontally

A plus on the outside moves it up
A plus on the outside moves it up
A minus on the outside moves it down
That's how you move vertically

A number more than one makes it thin
A number less than one makes fat
A negative flips it upside down
That's how you change the shape

Project Ideas

Graphing Project (using Desmos)
Water Fountain
Model Home
Valentine



www.desmos.com

A Perfect Number (28) of Activities for the Math Classroom

Session 221 (powerpoint and handout are on the conference planner)

Please fill out the purple evaluation!!!

Gregory Fisher, Mt. Tabor High School, Winston-Salem, NC, gsfisher@wsfsc.k12.nc.us
http:www.wsfcs.k12.nc.us/Domain/798

Fred Thompson, East Forsyth High School, Kernersville, NC, fgthompson@wsfcs.k12.nc.us