



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

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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 (I)

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	<input type="checkbox"/>	5	<input type="checkbox"/>	7	<input checked="" type="checkbox"/> A	18	<input type="checkbox"/>	11	<input type="checkbox"/>
23	<input type="checkbox"/>	4	<input type="checkbox"/>	2	<input type="checkbox"/>	10	<input type="checkbox"/>	12	<input type="checkbox"/>
14	<input type="checkbox"/>	3	<input type="checkbox"/>	Free	<input type="checkbox"/>	1	<input type="checkbox"/>	13	<input type="checkbox"/>
15	<input type="checkbox"/>	16	<input type="checkbox"/>	17	<input type="checkbox"/>	9	<input type="checkbox"/>	20	<input type="checkbox"/>
22	<input type="checkbox"/>	6	<input type="checkbox"/>	8	<input type="checkbox"/>	19	<input type="checkbox"/>	21	<input type="checkbox"/>

1: 32

7: 16

2: All Real Numbers

8: $3x + 2$

3: $y > 3$

9: $3(x + 2)$

4: 26

etc...

5: Octagon

29: $5x$

6: $180(n - 2)$

30: No solution

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

B. Simplify $3x + 2x$

Four in a Row (5)

				X		
			O	O		

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)

		X				
X	O					

With "gravity"

		X	O			
		X				

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!**

$2(x-3)=2x-6$ <p style="text-align: center;">A</p>	$(a + 3) + 4 = a + (3 + 4)$ <p style="text-align: center;">B</p>	$5*a*b = 5*b*a$ <p style="text-align: center;">C</p>	$(5 + 4) + 2 = (4 + 5) + 2$ <p style="text-align: center;">D</p>
$-6 + 6 = 0$ <p style="text-align: center;">G</p>	$5 + 0 = 5$ <p style="text-align: center;">H</p>	$6 * 1 = 6$ <p style="text-align: center;">I</p>	$2 (1/2) = 1$ <p style="text-align: center;">J</p>
$5+x = 6 \rightarrow$ $5+-5+x = 6 + -5$ <p style="text-align: center;">M</p>	$2x = 6$ $2(1/2)x = 6(1/2)$ <p style="text-align: center;">N</p>	$0*5 = 0$ <p style="text-align: center;">O</p>	$5*(3*2)=(5*3)*2$ <p style="text-align: center;">P</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)

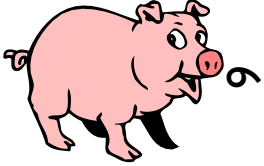
Complain for 30 seconds. If you can't think of anything to complain about then just say "Grumble."

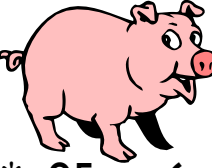


Use for finding mean, median, mode etc....

Use for rate of change or linear regression

Time	Grumbles
30	8
40	12
50	18

Puzzle (9)

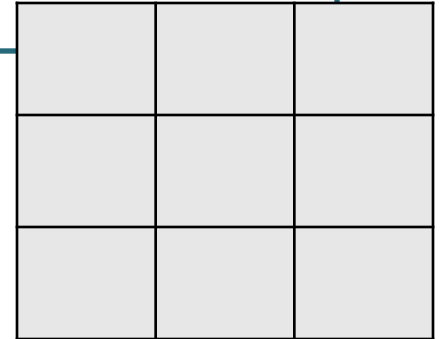
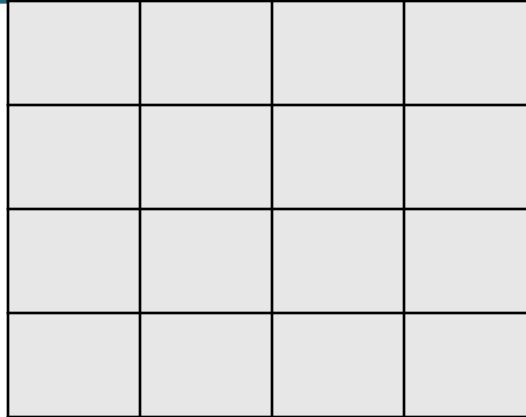
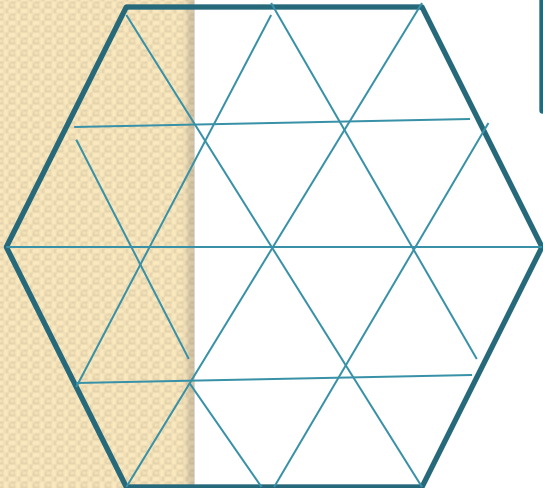
$3+27$
 $100+2$

 $95 + 6$

$3+27$ $100+2$  $95 + 6$	$4+2$ $1+1$  12
101 $3+27$	2  $3+7$ $100+2$

$3+27$
 $100+2$
 101
 10

$3+7$
 $100+2$

 2



Dominoes (10) <Not the pizza>

Start I	$3x = 6$	$\{2\}$	L	$5x = -25$	$\{-5\}$	T	$3x = 3x+2$	No solution E	$6x=30$
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$\{5\}$	S	$x = 3x+2$	<hr/>	N	Finish	$6x=30$	E	solution
---------	----------	------------	-------	----------	--------	---------	----------	----------

$\{-5\}$	T	$3x = 3x+2$
----------	----------	-------------

$\{5\}$	S	$x = 3x+2$
---------	----------	------------

$\{2\}$	L	$5x = -25$
---------	----------	------------

<hr/>	N	Finish
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Dominoes (10) <Not the pizza>

$$2x^{\frac{5}{2}}y^{\frac{1}{2}} \quad \mathbf{C} \quad \sqrt[3]{27x^{12}y^5}$$

$$3x^4y^{\frac{5}{3}} \quad \mathbf{G} \quad \sqrt{64x^2y^3}$$

$$\text{_____} \quad \mathbf{L} \quad \sqrt{9x^6y^4}$$

$$3x^3y^2 \quad \mathbf{F} \quad (16x^5y)^{\frac{1}{2}}$$

$$4x^{\frac{5}{2}}y^{\frac{1}{2}} \quad \mathbf{M} \quad (8x^7y^2)^{\frac{1}{3}}$$

$$2x^{\frac{7}{3}}y^{\frac{2}{3}} \quad \mathbf{B} \quad \sqrt[3]{64x^2y^3}$$

$$4x^{\frac{2}{3}}y \quad \mathbf{I} \quad (9x^5y)^{\frac{1}{2}}$$

$$3x^{\frac{5}{2}}y \quad \mathbf{A} \quad \sqrt[3]{8x^2y^7}$$

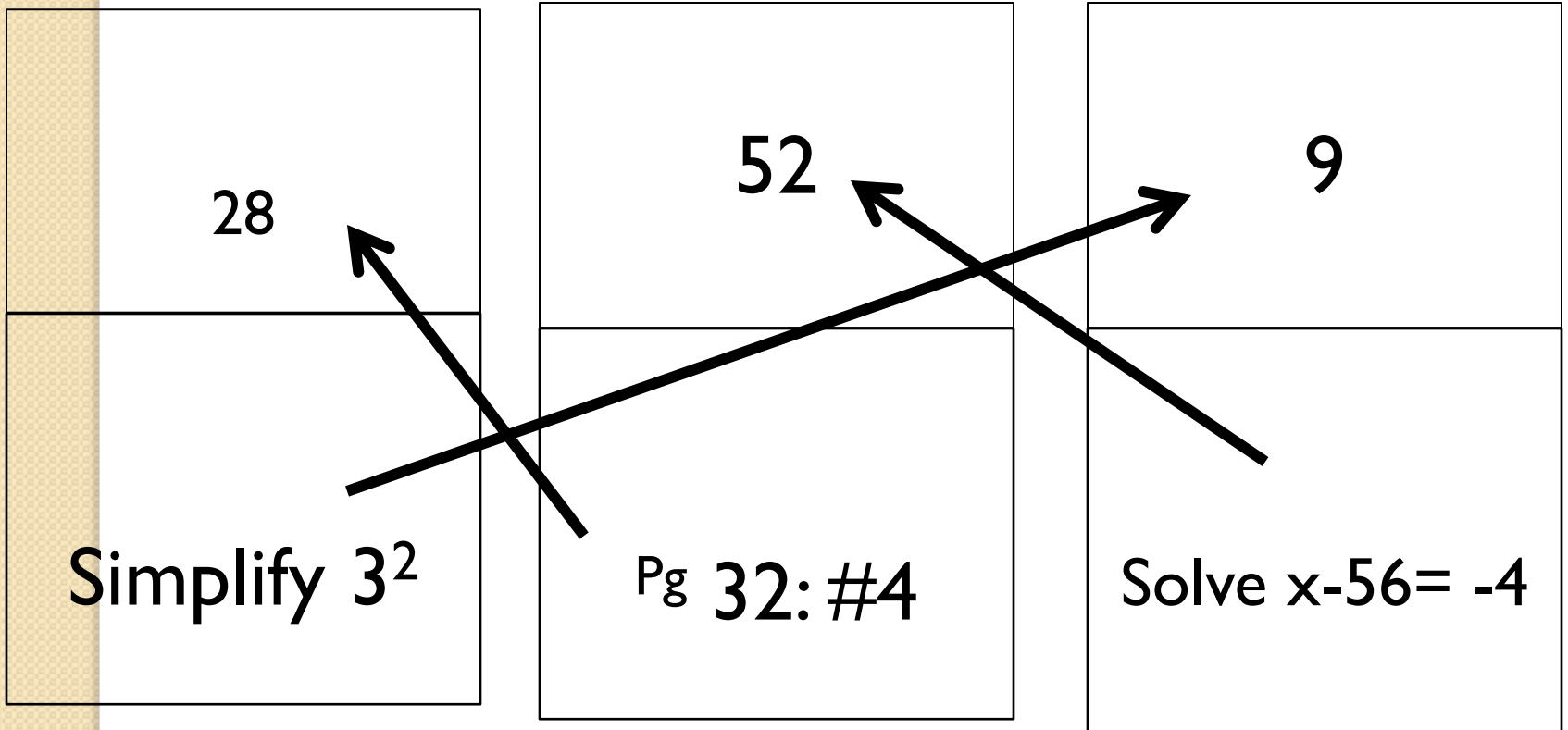
$$2x^{-y^{\frac{7}{3}}} \quad \mathbf{D} \quad (9x^3y^7)^{\frac{1}{2}}$$

$$3x^{\frac{3}{2}}y^{\frac{7}{2}} \quad \mathbf{E} \quad (64x^5y)^{\frac{1}{3}}$$

$$4x^{\frac{5}{3}}y^{\frac{1}{3}} \quad \mathbf{K} \quad (27x^6y^9)^{\frac{1}{3}}$$

$$3x^2y^3 \quad \mathbf{H} \quad \sqrt{4x^5y}$$

Circuit (I I)



Matching Cards (12)

5^{-2}	$1/25$
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$$-25$$

-5^{-2}	$-1/25$
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$$1/25$$

-5^2	-25
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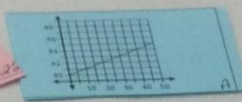
$$-1/25$$

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

slope = 0.10
y-intercept = 40

NEXT = NOW + 0.10,
starting at 40

$y = 40 + 0.10x$



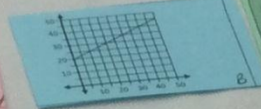
X	0	10	20	40
Y	40	41	42	

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

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

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

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



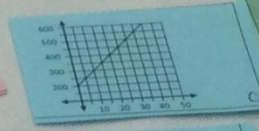
X	0	2	4	6
Y	20	21		23

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

slope = 10
y-intercept = 200

NEXT = NOW + 10,
starting at 200

$y = 200 - 10x$

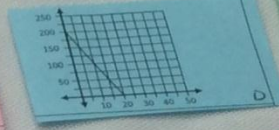


X	0	2	4	6
Y	200		240	260

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

slope = -10
y-intercept = 200

$y = 200 - 10x$



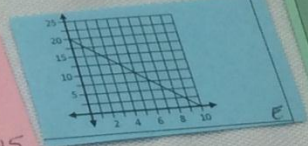
X	0		6	10
Y	200	160	140	100

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

slope = -2
y-intercept = 20

NEXT = NOW - 2,
starting at 20

$y = 20 - 2x$



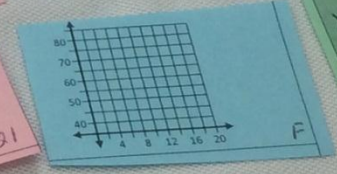
X	0	3	5	8
Y		14	10	4

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

slope = 3
y-intercept = 40

NEXT = NOW + 3,
starting at 40

$y = 40 + 3x$

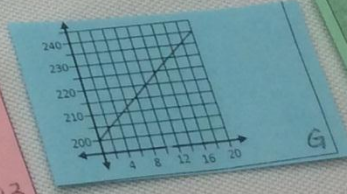


X		8	10	13
Y	55	64	70	79

slope = 2
y-intercept = 200

NEXT = NOW + 2,
starting at 200

$y = 200 + 2x$

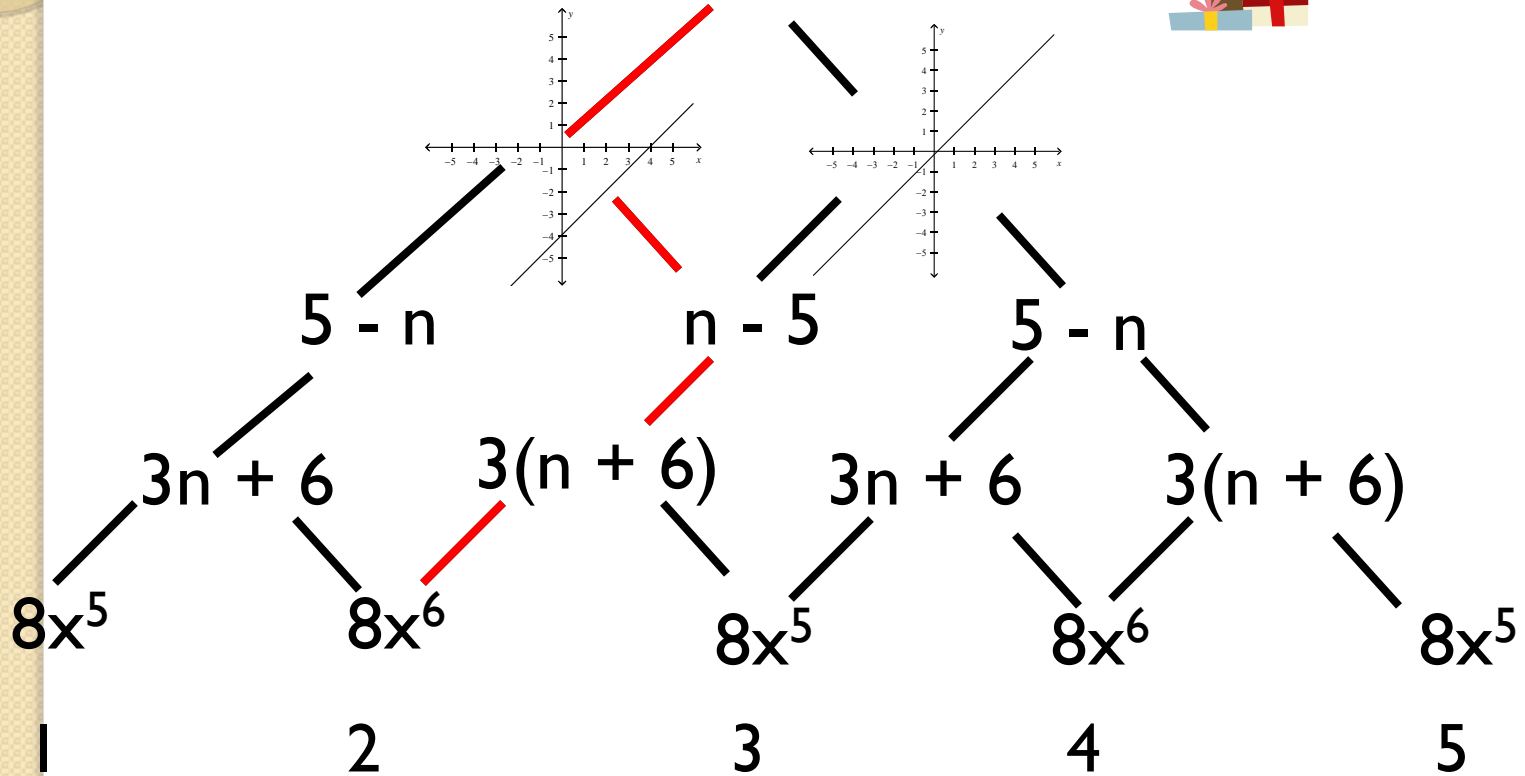


X	3	7
Y	206	214

Listening Tree (13)



START



Listening Tree (I3)

START

$$10(1.057)^x$$

$$10(1.57)^x$$

$$20000(.86)^x$$

$$20000(.14)^x$$

$$20000(.86)^x$$

$$5(2)^x$$

$$5(2)^{x/3}$$

$$5(2)^x$$

$$5(2)^{x/3}$$

$$30(.6)^x$$

$$30(.4)^x$$

$$30(.6)^x$$

$$30(.4)^x$$

$$30(.6)^x$$

$$100+20x$$

$$100(1.2)^x$$

$$100+20x$$

$$100(1.2)^x$$

$$100+20x$$

$$100(1.2)^x$$

A

B

C

D

E

F

Fisher Says (14)

If I say “Fisher Says” then model what I say

If I don't say “Fisher Says” then “Freeze!!!”

$$(-3,4)$$

$$y = x$$

$$(2,0)$$

$$y = 3$$

$$x = 3$$

$$y = x + 1$$

$$y = 4x + 3$$

$$y = 2x - 1$$

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

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

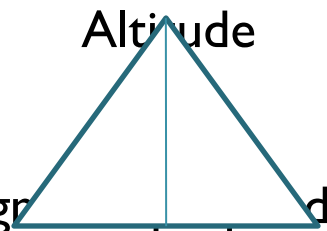
Midpoint

$\frac{x_2 + x_1}{2}$ Enter divided by 2, $\frac{y_2 + y_1}{2}$ enter divided by 2

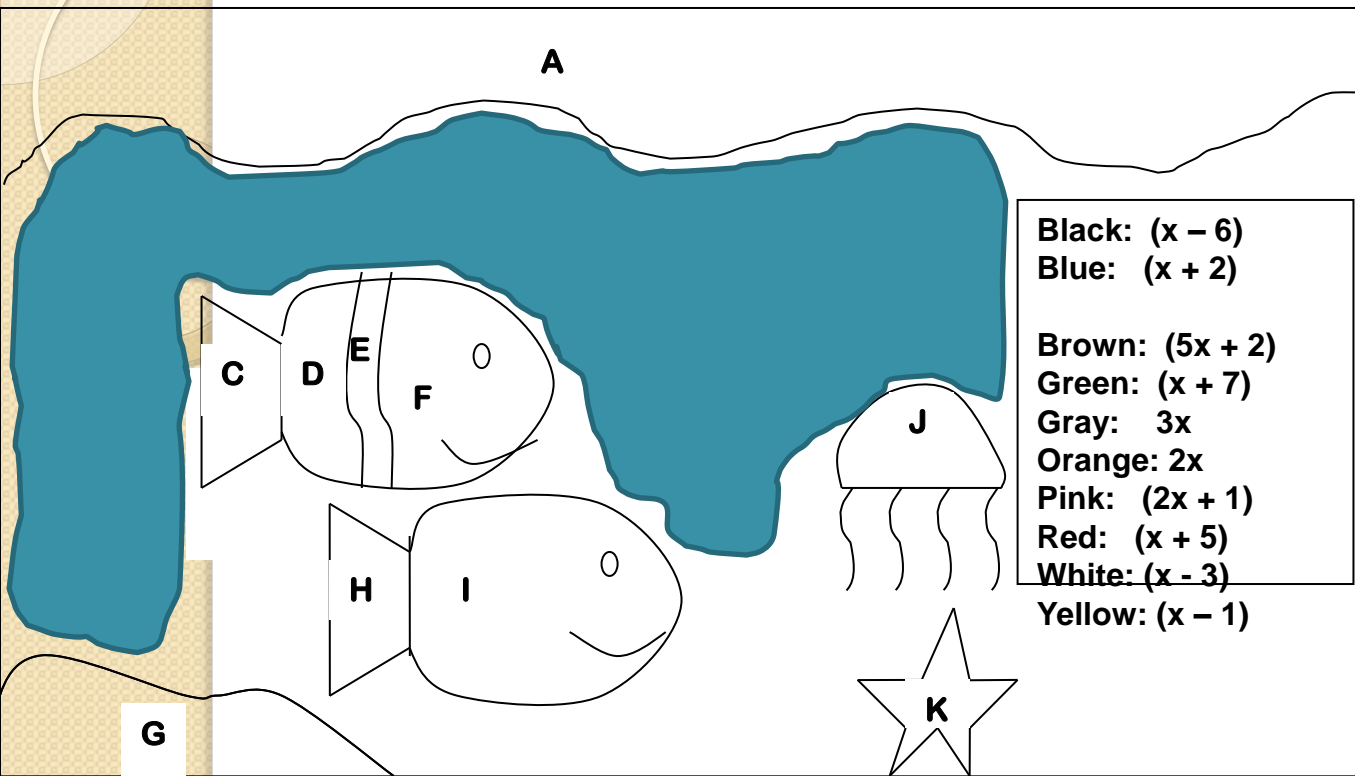
Volume of a Pyramid

$$V = \frac{1}{3}Bh$$

Altitude



Segment perpendicular to opposite side from vertex



- Black: $(x - 6)$
- Blue: $(x + 2)$
- Brown: $(5x + 2)$
- Green: $(x + 7)$
- Gray: $3x$
- Orange: $2x$
- Pink: $(2x + 1)$
- Red: $(x + 5)$
- White: $(x - 3)$
- Yellow: $(x - 1)$

B	$x^2 + 6x + 8$	$(x + 4)(x + 2)$	Blue
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Color by Number for Factoring (16)

Partner Activity (17)

Set 1A

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

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

Set 1B

- A. $9x = 36$ A. 4
- B. $4x = -12$ B. -3
- C. $8x = 16$ C. 2
- D. $10x = -20$ D. -2

Set 2A

- 5.
- 6.
- 7.
- 8.

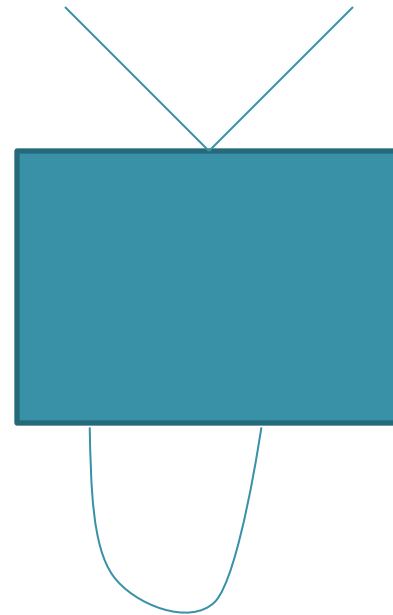
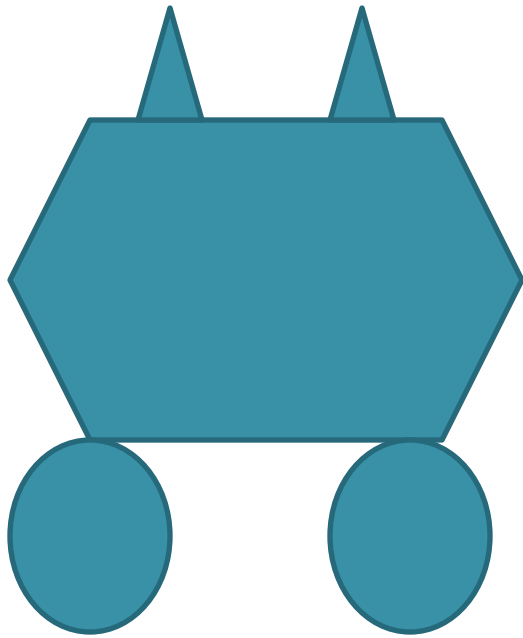
Set 2B

- 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) $15x^2*y^3$ 1 pt
- b) $5*3*x*y*y^2$ 1 pt
- 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))

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

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

$$\begin{aligned} L \circ R(3) &= L(R(3)) = L(3^2 - 6(3) + 7) \\ &= L(-2) = -5(-2) - 2 = 8 \end{aligned}$$

$$\begin{aligned} R(L(2)) &= R(-5(2) - 2) = R(-12) = \\ &(-12)^2 - 6(-12) + 7 = 223 \end{aligned}$$

$$\begin{aligned} L \circ R(x) \quad L(R(x)) &= L(x^2 - 6x + 7) \\ &= -5(x^2 - 6x + 7) - 2 \\ &= -5x^2 + 30x - 35 - 2 \\ &= -5x^2 + 30x - 37 \end{aligned}$$

Human Number Line (27)

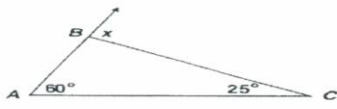
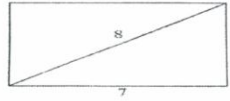
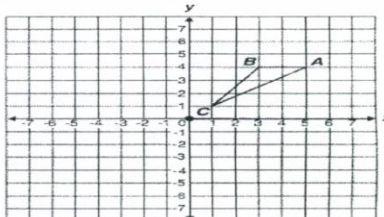
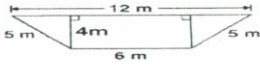
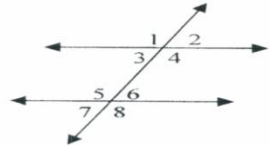
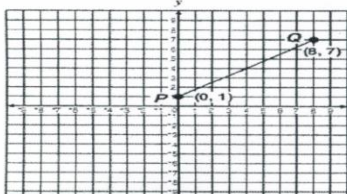
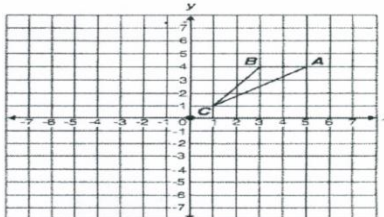
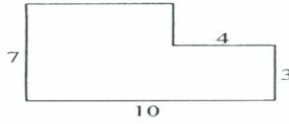
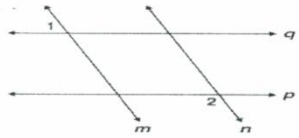
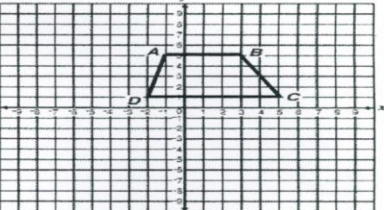

Have the students arrange the cards (or themselves) from smallest to largest...

Example

$$\begin{array}{cccc} -4^2 & (-4)^2 & 3(2)^2 & -3-5 \\ 3.14 & Pi & 8-3 & -4+5 \\ 1+1+1+1+1+1+1*0 & & & \end{array}$$

Give-one Take-one (28)

Give-One Get-One

Angle Relationships	Pythagorean Theorem	Transformations	Area of Figures
<p>1. What is $m\angle x$?</p> 	<p>2. What is the height of this rectangle?</p> 	<p>3. If triangle ABC is rotated 180 degrees about the origin, what are the coordinates of A'?</p> 	<p>4. What is the area, in square meters (m), of the trapezoid shown below?</p> 
<p>5. Name the angle relationships.</p>  <p>$\angle 1$ & $\angle 2$ $\angle 5$ & $\angle 8$ $\angle 5$ & $\angle 4$ $\angle 8$ & $\angle 4$</p>	<p>6. What is the length of line segment PQ shown below?</p> 	<p>7. Reflect triangle ABC across the x-axis.</p> 	<p>8. What is the area of the figure?</p> 
<p>9. Given: $p \parallel q$; $m \parallel n$; $m\angle 1 = 75^\circ$</p>  <p>What is $m\angle 2$?</p> <p>A 15° B 75° C 90° D 105°</p>	<p>10. A right triangle's hypotenuse has length 5. If one leg has length 2, what is the length of the other leg?</p> <p>A 3 B $\sqrt{21}$ C $\sqrt{29}$ D 7</p>	<p>11. Trapezoid $ABCD$ below is to be translated to trapezoid $A'B'C'D'$ by the following motion rule.</p> <p>$(x, y) \rightarrow (x + 3, y - 4)$</p>  <p>What will be the coordinates of vertex C'?</p> <p>A $(1, -3)$ B $(2, 1)$ C $(6, 1)$ D $(8, -3)$</p>	<p>12. The rectangle shown below has length 20 meters and width 10 meters.</p>  <p>If four triangles are removed from the rectangle as shown, what will be the area of the remaining figure?</p> <p>A 136 m^2 B 144 m^2 C 168 m^2 D 184 m^2</p>

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")

$$(+ \quad +) = (+)(+) \quad (- \quad +) = (-)(-)$$

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

$$(+ \quad -) = (+)(-)$$

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 moves it right

That's 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

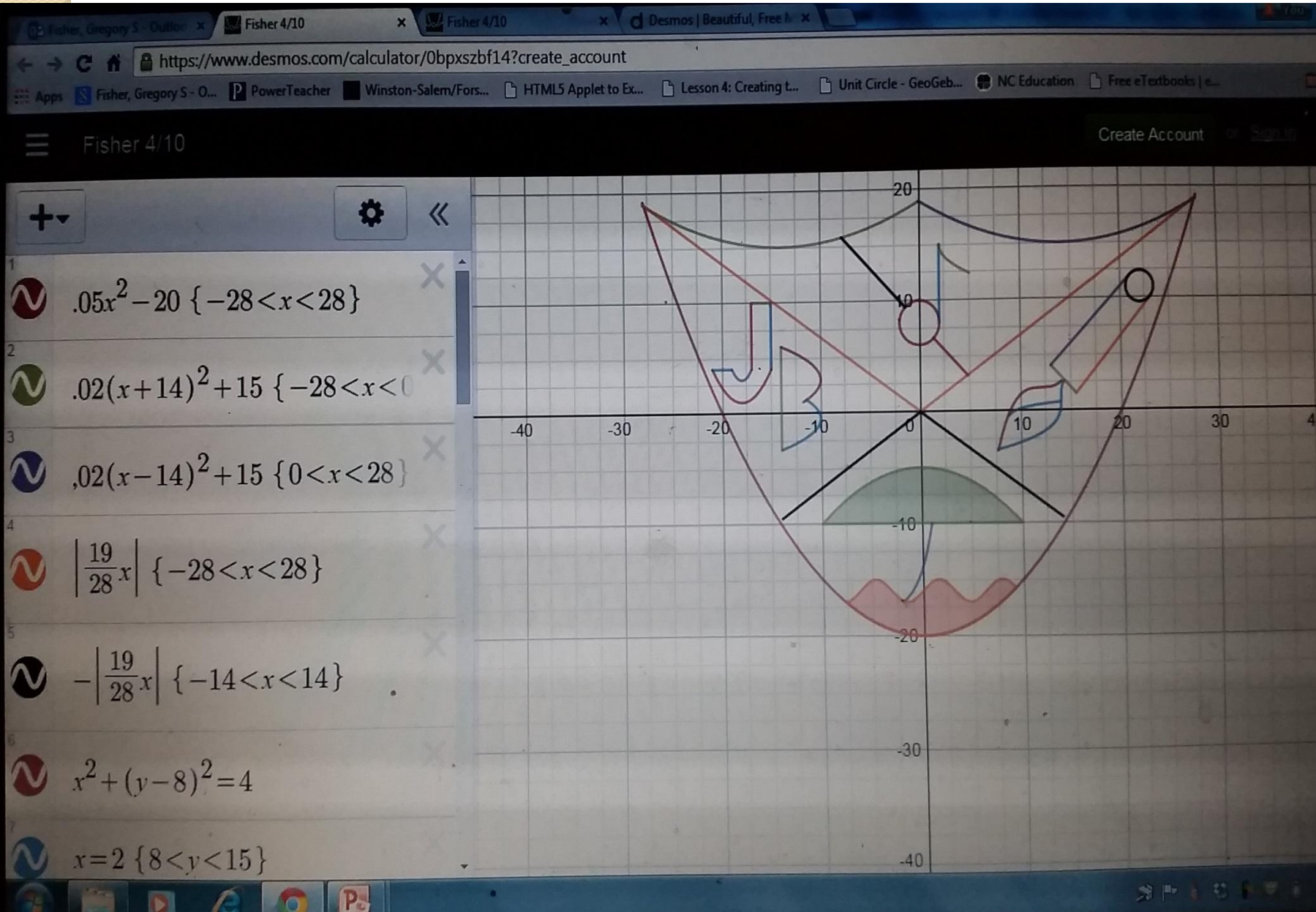
Project Ideas

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!!!

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