

Targeting Foundational Math Skills for Maximum Gains

Information, Resources, and Strategies for the
Classroom

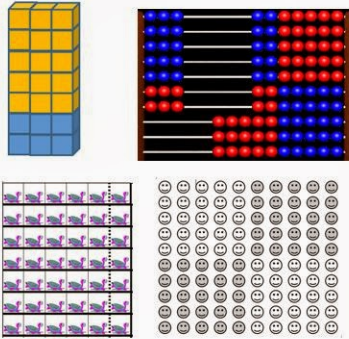
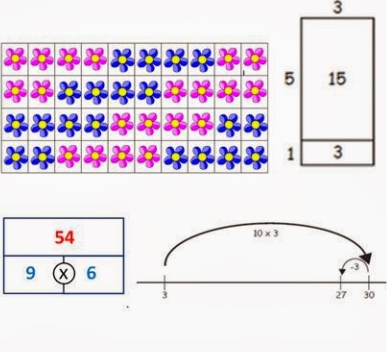
**WE'RE NOT
DONE YET**
2024 GED CONFERENCE

Table of Contents

Multiple Representations of Math Concepts	3
Partial Products	3
Number Lines	6
The Multiplication Table	7
Rates of Change	10
Graphing Points on a Coordinate Plane.....	11
Slope	12
Graphing Linear Equations.....	13
Stained Glass Window Activity.....	14
Key Features of Linear Graphs	15
Four-Step Method for Writing Linear Equations.....	15
Resources from the World Wide Web.....	16

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Multiple Representations of Math Concepts

Concrete	Representational	Abstract															
Students manipulate hands-on, concrete materials	Students draw and observe diagrams, or watch the teacher touching and moving hands-on materials	Numbers and mathematical symbols															
		<table border="1"> <thead> <tr> <th colspan="5">x 4 Patterns</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>8</td> <td>12</td> <td>16</td> <td>20</td> </tr> <tr> <td>24</td> <td>28</td> <td>32</td> <td>36</td> <td>40</td> </tr> </tbody> </table> 8×5 $45 \div 5$ $(4 \times 2) \times 5$ $(50-5) \div 5$ $4 \times (2 \times 5)$ $(50 \div 5) - (5 \div 5)$ 4×10 $10-1$ 40 9	x 4 Patterns					4	8	12	16	20	24	28	32	36	40
x 4 Patterns																	
4	8	12	16	20													
24	28	32	36	40													

Partial Products

1 $20 \times 19 = \underline{\hspace{2cm}}$

2 $37 \times 76 = \underline{\hspace{2cm}}$

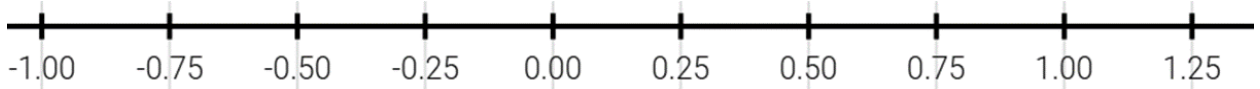
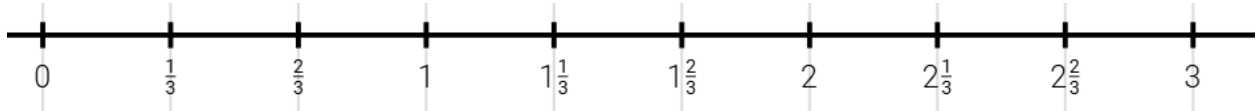
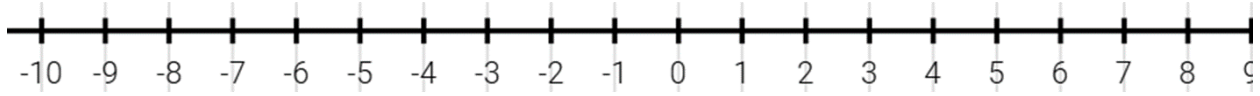
Number Charts

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

$\frac{1}{8}$	$\frac{2}{8}$	$\frac{3}{8}$	$\frac{4}{8}$	$\frac{5}{8}$	$\frac{6}{8}$	$\frac{7}{8}$	$\frac{8}{8}$
$\frac{9}{8}$	$\frac{10}{8}$	$\frac{11}{8}$	$\frac{12}{8}$	$\frac{13}{8}$	$\frac{14}{8}$	$\frac{15}{8}$	$\frac{16}{8}$
$\frac{17}{8}$	$\frac{18}{8}$	$\frac{19}{8}$	$\frac{20}{8}$	$\frac{21}{8}$	$\frac{22}{8}$	$\frac{23}{8}$	$\frac{24}{8}$
$\frac{25}{8}$	$\frac{26}{8}$	$\frac{27}{8}$	$\frac{28}{8}$	$\frac{29}{8}$	$\frac{30}{8}$	$\frac{31}{8}$	$\frac{32}{8}$
$\frac{33}{8}$	$\frac{34}{8}$	$\frac{35}{8}$	$\frac{36}{8}$	$\frac{37}{8}$	$\frac{38}{8}$	$\frac{39}{8}$	$\frac{40}{8}$
$\frac{41}{8}$	$\frac{42}{8}$	$\frac{43}{8}$	$\frac{44}{8}$	$\frac{45}{8}$	$\frac{46}{8}$	$\frac{47}{8}$	$\frac{48}{8}$
$\frac{49}{8}$	$\frac{50}{8}$	$\frac{51}{8}$	$\frac{52}{8}$	$\frac{53}{8}$	$\frac{54}{8}$	$\frac{55}{8}$	$\frac{56}{8}$
$\frac{57}{8}$	$\frac{58}{8}$	$\frac{59}{8}$	$\frac{60}{8}$	$\frac{61}{8}$	$\frac{62}{8}$	$\frac{63}{8}$	$\frac{64}{8}$

$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$	2
$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{3}{8}$	$2\frac{1}{2}$	$2\frac{5}{8}$	$2\frac{3}{4}$	$2\frac{7}{8}$	3
$3\frac{1}{8}$	$3\frac{1}{4}$	$3\frac{3}{8}$	$3\frac{1}{2}$	$3\frac{5}{8}$	$3\frac{3}{4}$	$3\frac{7}{8}$	4
$4\frac{1}{8}$	$4\frac{1}{4}$	$4\frac{3}{8}$	$4\frac{1}{2}$	$4\frac{5}{8}$	$4\frac{3}{4}$	$4\frac{7}{8}$	5
$5\frac{1}{8}$	$5\frac{1}{4}$	$5\frac{3}{8}$	$5\frac{1}{2}$	$5\frac{5}{8}$	$5\frac{3}{4}$	$5\frac{7}{8}$	6
$6\frac{1}{8}$	$6\frac{1}{4}$	$6\frac{3}{8}$	$6\frac{1}{2}$	$6\frac{5}{8}$	$6\frac{3}{4}$	$6\frac{7}{8}$	7
$7\frac{1}{8}$	$7\frac{1}{4}$	$7\frac{3}{8}$	$7\frac{1}{2}$	$7\frac{5}{8}$	$7\frac{3}{4}$	$7\frac{7}{8}$	8

Number Lines



Practice:

1 $-0.27, \frac{5}{8}, 0.4, 2\frac{1}{8}, 2.4, -8.2$



2 $-3\frac{1}{3}, 0.2, -\frac{1}{6}, 3, -3.33, \frac{9}{10}$



The Multiplication Table

1	2	3	4	5	6	7	8	9	10	11	12
2	4	6	8	10	12	14	16	18	20	22	24
3	6	9	12	15	18	21	24	27	30	33	36
4	8	12	16	20	24	28	32	36	40	44	48
5	10	15	20	25	30	35	40	45	50	55	60
6	12	18	24	30	36	42	48	54	60	66	72
7	14	21	28	35	42	49	56	63	70	77	84
8	16	24	32	40	48	56	64	72	80	88	96
9	18	27	36	45	54	63	72	81	90	99	108
10	20	30	40	50	60	70	80	90	100	110	120
11	22	33	44	55	66	77	88	99	110	121	132
12	24	36	48	60	72	84	96	108	120	132	144

1	2	3	4	5	6	7	8	9	10	11	12
2	4	6	8	10	12	14	16	18	20	22	24
3	6	9	12	15	18	21	24	27	30	33	36
4	8	12	16	20	24	28	32	36	40	44	48
5	10	15	20	25	30	35	40	45	50	55	60
6	12	18	24	30	36	42	48	54	60	66	72
7	14	21	28	35	42	49	56	63	70	77	84
8	16	24	32	40	48	56	64	72	80	88	96
9	18	27	36	45	54	63	72	81	90	99	108
10	20	30	40	50	60	70	80	90	100	110	120
11	22	33	44	55	66	77	88	99	110	121	132
12	24	36	48	60	72	84	96	108	120	132	144

Practice Problems:

Solve the following word problems.

1. It takes one Super Giant Pizza to feed 3 people. If you invite 36 people, how many pizzas will you need?
2. The ratio of boys to girls is 3 to 2. If there are 12 boys, how many girls are there?
3. Jack was planting a tree. He was to dig a hole that was 3 feet deep for every 5 feet of tree height. How deep should he dig the hole for a tree that is 12 feet high?

1	2	3	4	5	6	7	8	9	10
2	4	6	8	10	12	14	16	18	20
3	6	9	12	15	18	21	24	27	30
4	8	12	16	20	24	28	32	36	40
5	10	15	20	25	30	35	40	45	50
6	12	18	24	30	36	42	48	54	60
7	14	21	28	35	42	49	56	63	70
8	16	24	32	40	48	56	64	72	80
9	18	27	36	45	54	63	72	81	90
10	20	30	40	50	60	70	80	90	100

Practice Problems:

Use the multiplication table to solve the following:

1. 50% of 60 =
2. 60% of 50 =
3. 70% of 30 =
4. 30% of 70 =
5. 20% of 80 =
6. 80% of 20 =

Rates of Change

Find the rate of change of the following rows of highlighted numbers.

1	2	3	4	5	6	7	8	9	10	11	12
2	4	6	8	10	12	14	16	18	20	22	24
3	6	9	12	15	18	21	24	27	30	33	36
4	8	12	16	20	24	28	32	36	40	44	48
5	10	15	20	25	30	35	40	45	50	55	60
6	12	18	24	30	36	42	48	54	60	66	72
7	14	21	28	35	42	49	56	63	70	77	84
8	16	24	32	40	48	56	64	72	80	88	96
9	18	27	36	45	54	63	72	81	90	99	108
10	20	30	40	50	60	70	80	90	100	110	120
11	22	33	44	55	66	77	88	99	110	121	132
12	24	36	48	60	72	84	96	108	120	132	144

Rate of change of 1st highlighted row = _____

Rate of change of 2nd highlighted row = _____

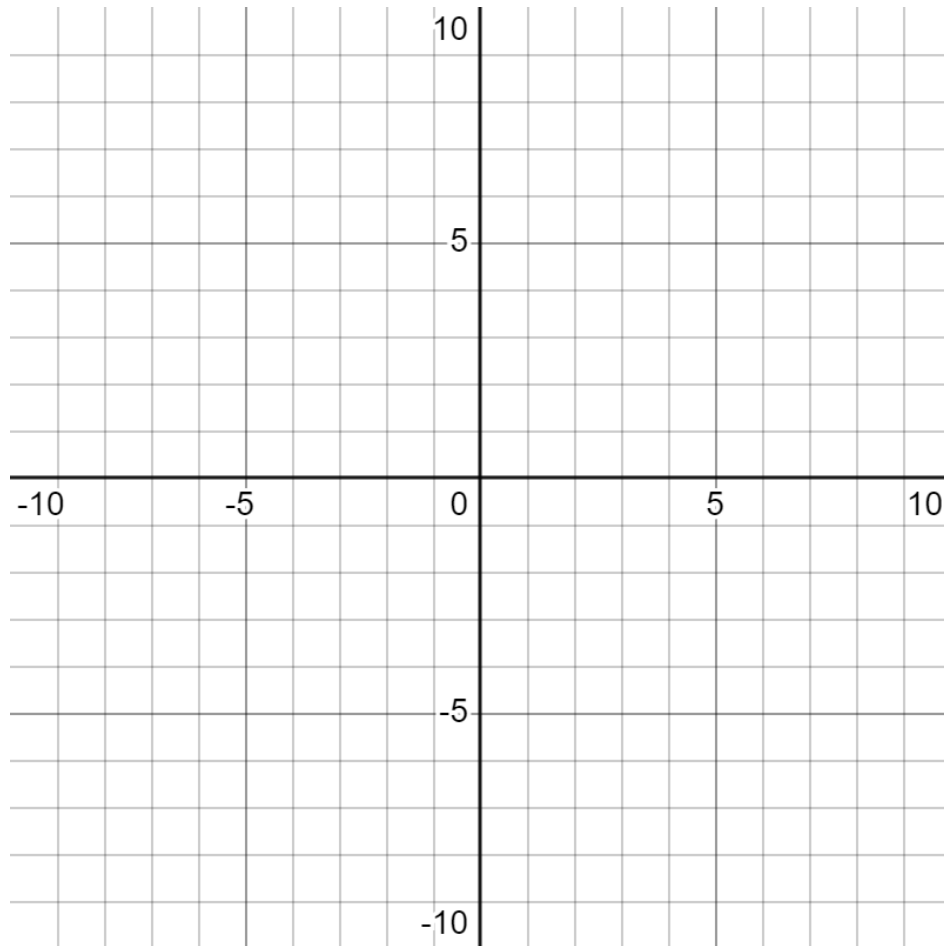
Rate of change of 3rd highlighted row = _____

Rate of change of 4th highlighted row = _____

Graphing Points on a Coordinate Plane

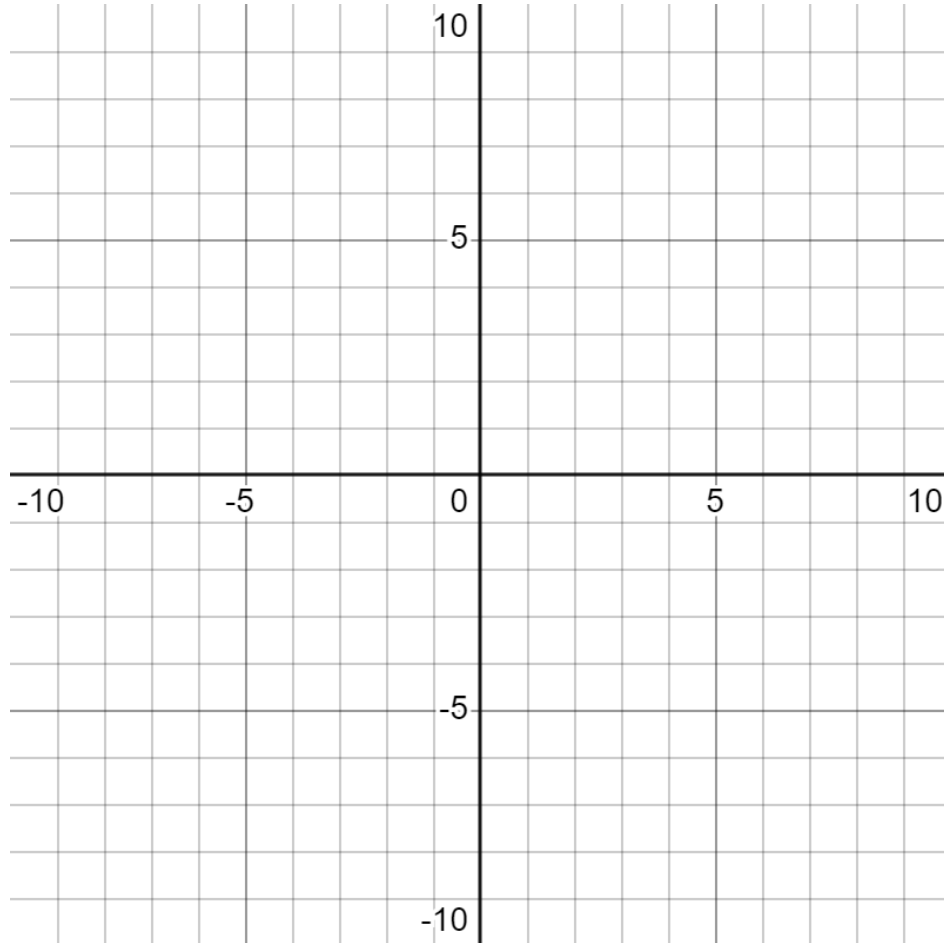
Graph the line representing the Multiples of 4 table below.

x	y
1	4
2	8
3	12
4	16
5	20
6	24
7	28
8	32
9	36
10	40
11	44
12	48



Graph the line representing the Multiples of 7 table below.

x	y
1	7
2	14
3	21
4	28
5	35
6	42
7	49
8	56
9	63
10	70
11	77
12	84



Use the charts below to provide various representations of the different types of slope.

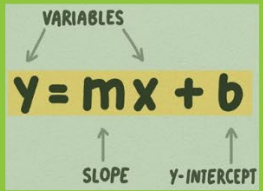
Positive Slope		
Concrete	Representational	Abstract

Negative Slope		
Concrete	Representational	Abstract

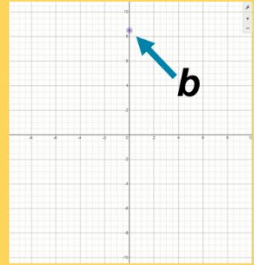
Zero Slope		
Concrete	Representational	Abstract

Graphing Linear Equations

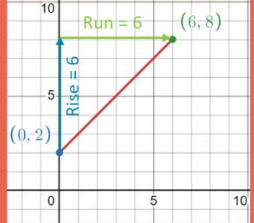
1 Make sure the linear equation is in the form $y = mx + b$.



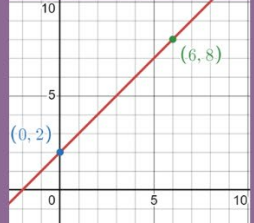
2 Plot the point $(0, b)$ on the Y-axis (Optional: Label this point b).



3 Convert m into a fraction and start drawing a line from b using rise over run.



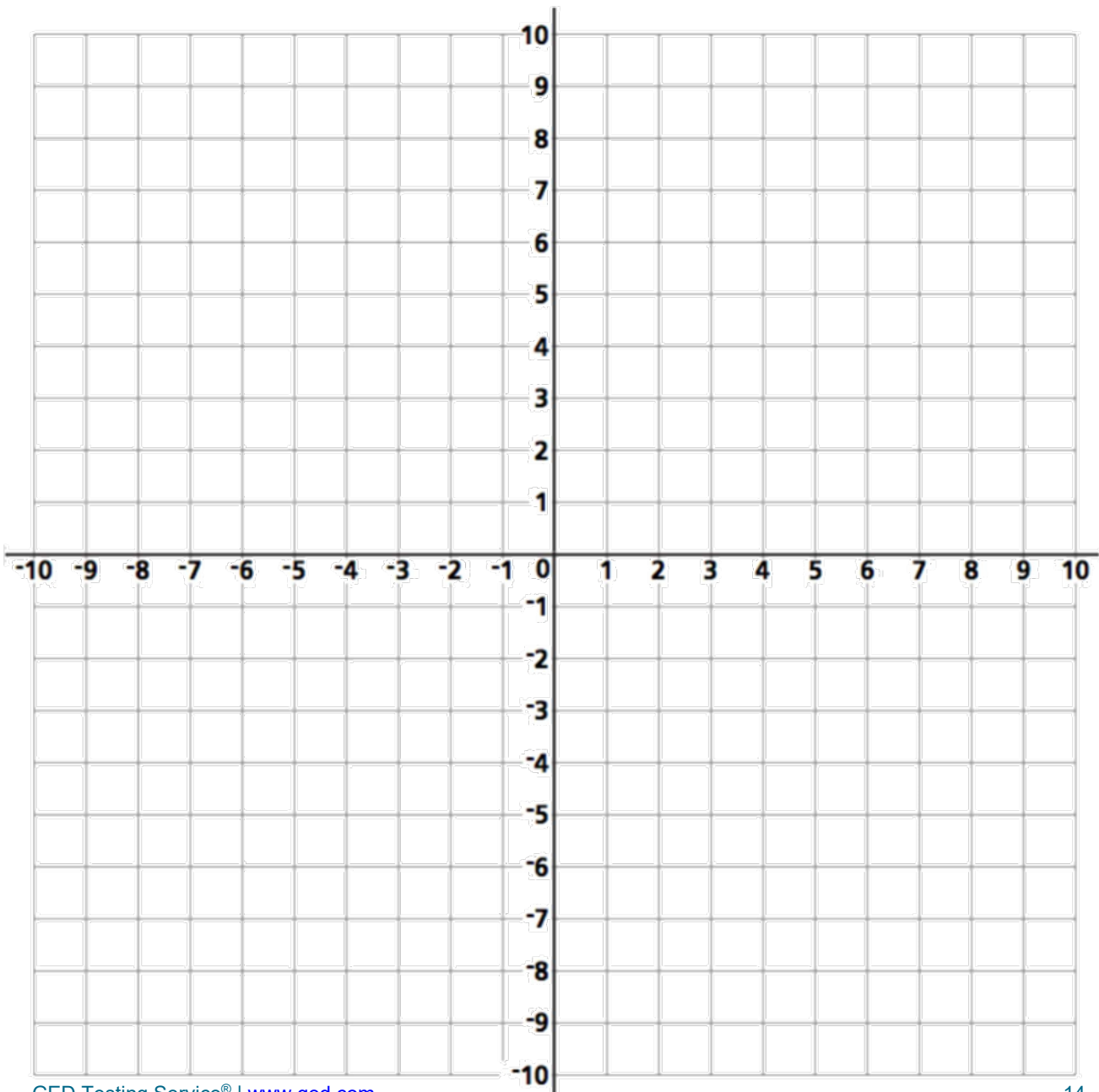
4 Extend the line on both sides, using a straight edge or a ruler.



Stained Glass Window: Graphing Slope-Intercept Linear Equations

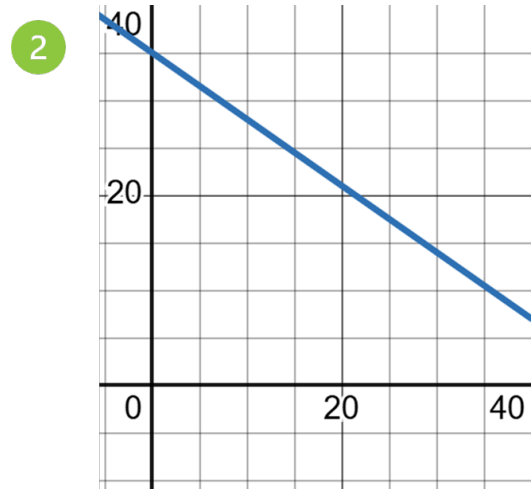
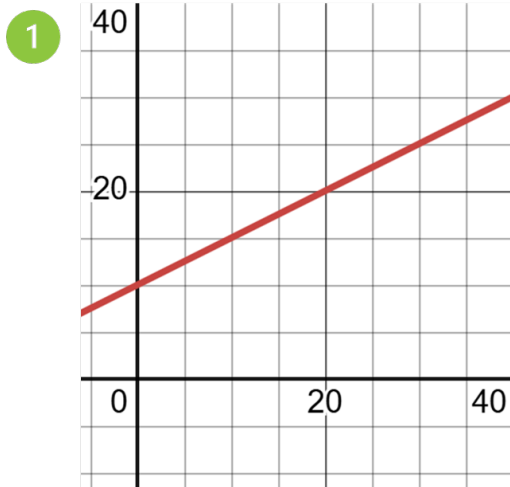
Circle three (3) linear equations from each box. Use your knowledge of slope and y-intercept to graph these twelve linear equations on the coordinate plane below. Write the equation on each line that you graph. When you are done graphing the equations, use crayons to color each section and create a stained-glass window.

$x = -8$ $x = -5$ $x = -1$ $x = 2$ $x = 7$ $x = 9$	$y = -9$ $y = -5$ $y = -2$ $y = 1$ $y = 6$ $y = 8$	$y = x + 5$ $y = 2x - 7$ $y = 4x + 8$ $y = 2x - 18$ $y = \frac{1}{4}x - 6$ $y = \frac{1}{2}x - 3$	$y = -x - 9$ $y = -2x + 8$ $y = -\frac{1}{3}x - 3$ $y = -\frac{1}{4}x + 5$ $y = -2x$ $y = -x + 12$
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Key Features of Linear Graphs

Instructions: Come up with real-world scenarios representing each graph. Identify the key features and explain what each key feature means in terms of your real-world scenario.



Four-Step Method for Writing Linear Equations

1. Identify Variables
2. Determine the Slope (Rate of Change)
3. Find the Y-Intercept (Starting Value)
4. Write the Equation in Slope-Intercept Form

Sample Problem

A car rental company charges a flat fee of \$50 plus \$0.20 per mile driven. Write the linear equation that represents the total cost y in terms of miles driven x .

Resources from the World Wide Web

Assessment Guide for Educators: Mathematical Reasoning

https://ged.com/wp-content/uploads/assessment_guide_for_educators_math.pdf

GED® High Impact Indicators

https://www.ged.com/wp-content/uploads/High_Impact_Indicators.pdf

GED® Performance Level Descriptors Level 1

https://www.ged.com/wp-content/uploads/pld_math_official_test_below_passing.pdf

GED® Performance Level Descriptors Level 2

https://www.ged.com/wp-content/uploads/pld_math_official_test_passing.pdf

GED® Performance Level Descriptors Level 3

https://www.ged.com/wp-content/uploads/pld_math_official_test_college_ready.pdf

GED® Performance Level Descriptors Level 4

https://www.ged.com/wp-content/uploads/pld_math_official_test_college_ready_credit.pdf

GED® Tips for Attaining High School Equivalency

https://www.ged.com/wp-content/uploads/Tips_Math_Attaining_HS_Equiv.pdf

Proportion Word Problems

https://cdnsm5-ss13.sharpschool.com/UserFiles/Servers/Server_77361/File/Departments/Mathematics/John%20Sidanycz/Math%201/Linear%20Unit/2018-2019/ratio%20proportion%20worksheet.pdf

Stained Glass Math Project

https://www.youtube.com/watch?v=b8E_-fqWpGU

The Math Learning Center

<https://www.mathlearningcenter.org/>

Fractions App

<https://www.mathlearningcenter.org/apps/fractions>

Number Charts App

<https://www.mathlearningcenter.org/apps/number-chart>

Number Line App

<https://www.mathlearningcenter.org/apps/number-line>

Number Pieces App

<https://www.mathlearningcenter.org/apps/number-pieces>

Partial Product Finder App

<https://www.mathlearningcenter.org/apps/partial-product-finder>

Whiteboard App

<https://apps.mathlearningcenter.org/whiteboard/>