Name: _____ Period: _____

Combining Linear Functions Notes

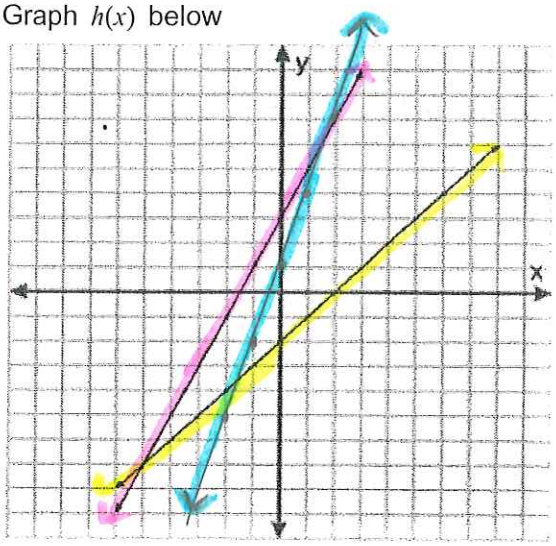
$f(x) = x - 2$ $g(x) = 2x + 3$

If I subtract f(x) and g(x) to get h(x) I predict the graph of h(x) will be:

Add: $h(x) = f(x) + g(x)$

$h(x) =$ $3x + 1$

Graph $h(x)$ below



When you add two linear equations together, the outcome is:

linear

Fill in the rest of the table. What do you notice?

x	$f(x)$	$g(x)$	$h(x)$
-2	-4	-1	-5
-1	-3	1	-2
0	-2	3	1
1	-1	5	4
2	0	7	7

If you add the outputs of f(x) & g(x) you get the outputs for h(x)

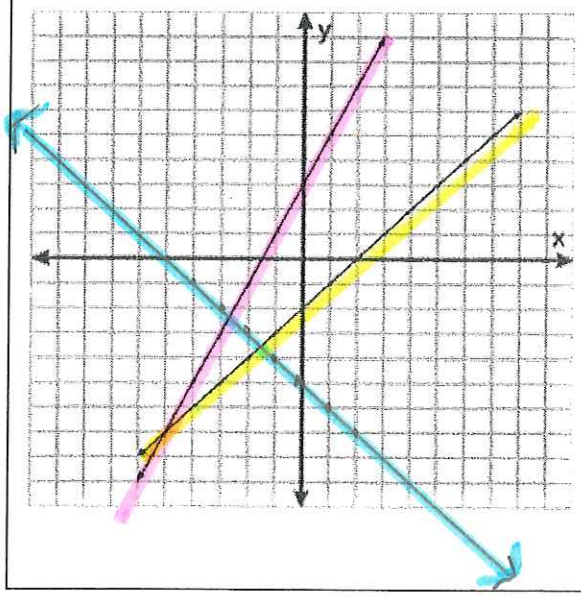
$f(x) = x - 2$ $g(x) = 2x + 3$

If I subtract f(x) and g(x) to get h(x) I predict the graph of h(x) will be:

Subtract: $h(x) = f(x) - g(x)$

$h(x) =$ $-x - 5$

Graph $h(x)$ below



When you subtract two linear equations, the outcome is:

linear.

Fill in the rest of the table. What do you notice?

x	$f(x)$	$g(x)$	$h(x)$
-2	-4	-1	-3
-1	-3	1	-4
0	-2	3	-5
1	-1	5	-6
2	0	7	-7

If you subtract the outputs of f(x) & g(x) you get the outputs for h(x).

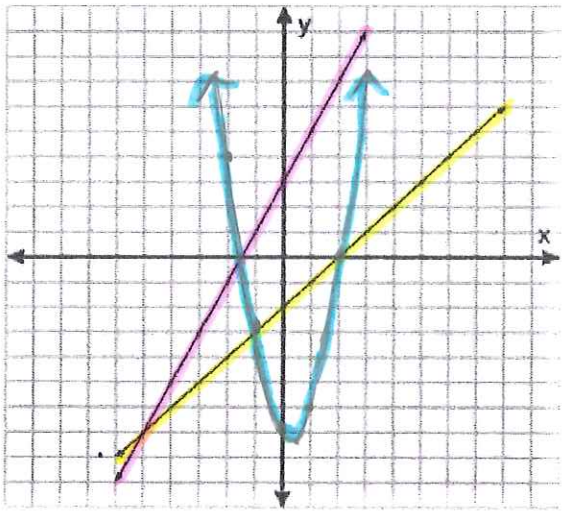
$f(x) = x - 2$ $g(x) = 2x + 3$

If I multiply f(x) and g(x) to get h(x), I predict the graph of $h(x)$ will be:

Multiply: $h(x) = f(x) \cdot g(x)$

$h(x) = 2x^2 - x - 6$

Graph $h(x)$ below



When you multiply two linear equations together, the outcome is:

a quadratic

Fill in the rest of the table. What do you notice?

x	$f(x)$	$g(x)$	$h(x)$
-2	-4	-1	4
-1	-3	1	-3
0	-2	3	-6
1	-1	5	-5
2	0	7	0

When you multiply the outputs of f(x) & g(x) you get the outputs of h(x).

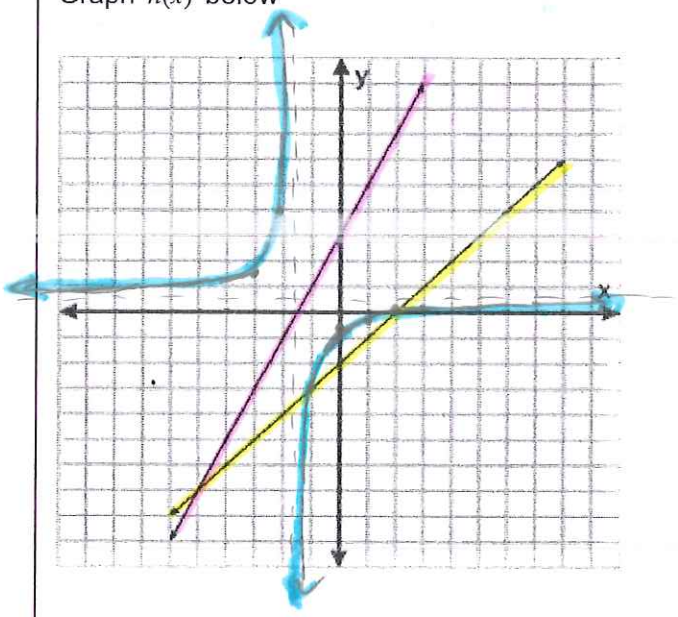
$f(x) = x - 2$ $g(x) = 2x + 3$

If I divide f(x) and g(x) to get h(x), I predict the graph of $h(x)$ will be:

Divide: $h(x) = f(x) \div g(x)$

$h(x) = \frac{x-2}{2x+3}$

Graph $h(x)$ below



When you divide one linear equation by another, the outcome is:

a rational function

Fill in the table. What do you notice?

x	$f(x)$	$g(x)$	$h(x)$
-3	-5	-3	$\frac{5}{3}$
-2	-4	-1	4
-1	-3	1	-3
0	-2	3	$-\frac{2}{3}$
1	-1	5	$-\frac{1}{5}$
2	0	7	0
3	1	9	$\frac{1}{9}$

When you divide the outputs of f(x) by g(x) you get the outputs for h(x).

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a.

Addition: When adding two linear functions, the new function is a polynomial of degree 1.	Subtraction: When subtracting two linear functions, the new function is a polynomial of degree 1.
Multiplication: When multiplying two linear functions the new funtion is a polynomial of degree 2.	Division: When dividing two linear functions the new function is not a polynomial because it is a rational function

b.

The results from adding, subtracting, multiplying and dividing the linear functions $f(x) = x - 2$ and $g(x) = 2x + 3$ can be generalized and apply to any two linear functions.