

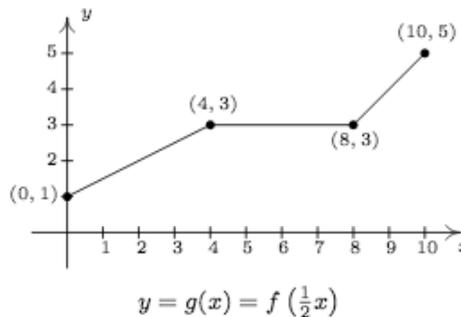
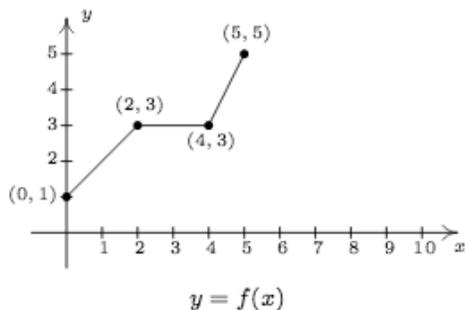
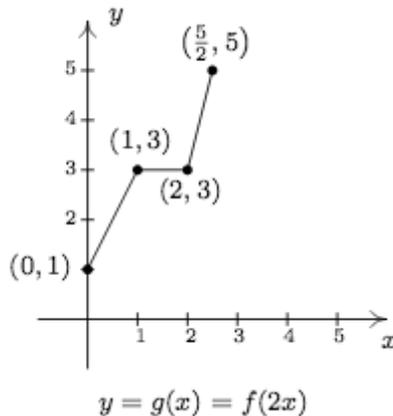
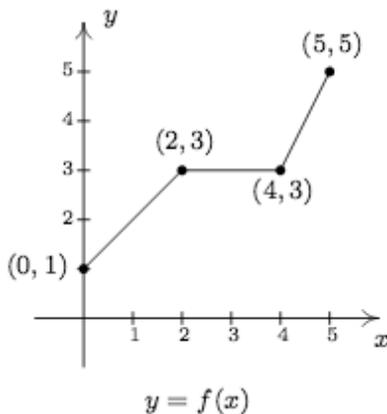
Transformation Rules Review

Given $y = f(x)$

- | | |
|---|--|
| 1. Reflection in x-axis | Replace $f(x)$ with $-[f(x)] \rightarrow y = -[f(x)]$ |
| 2. Reflection in y-axis | Replace each x with $-x \rightarrow y = f(-x)$ |
| 3. Stretch in vertically by a factor of $c, c > 1$ | Replace $f(x)$ with $c[f(x)] \rightarrow y = c[f(x)]$ |
| 4. Shrink in vertically by a factor of $c, 0 < c < 1$ | Replace $f(x)$ with $c[f(x)] \rightarrow y = c[f(x)]$ |
| 5. Stretch horizontally by a factor of $c, c > 1$ | Replace each x with $1/c(x) \rightarrow y = f(1/c(x))$ |
| 6. Shrink horizontally by a factor of $c, 0 < c < 1$ | Replace each x with $1/c(x) \rightarrow y = f(1/c(x))$ |
| 7. Translate c Units Right, $c > 0$ | Replace each x with $x - c \rightarrow y = f(x - c)$ |
| 8. Translate c Units Left, $c > 0$ | Replace each x with $x + c \rightarrow y = f(x + c)$ |
| 9. Translate c Units Up, $c > 0$ | Replace $f(x)$ with $[f(x) + c]$ |
| 10. Translate c Units Down, $c > 0$ | Replace $f(x)$ with $[f(x) - c]$ |

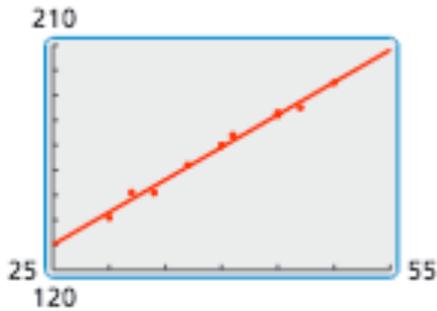
$f(x) = 2x^2 - 3x$. Find the equation for $g(x)$ that transforms $f(x)$ in the following manner:

1. Reflected across y-axis
2. Reflected across y-axis then Raised 2 units
3. Raised 2 units then Reflected across y-axis
4. Lower 3 units then Vertically Stretch by a factor of 2
5. Vertically Stretch by a factor of 2 then Lower by 3 units
6. Translate 6 units down then Vertically Stretch by a factor of 2
7. Shrink horizontally by a factor of $\frac{1}{2}$ then Translate up 3 units
8. Translate down 2 units then Shrink by a factor of $\frac{1}{2}$



x	40	45	32	50	37	41	30
y	170	183	151	195	162	174	141

We can make a scatter plot of the data and draw a line that best fits the data.



If we take two random points on the line, we can write the equation of the line. This is called the line of best fit. A Calculator can be used to perform a linear regression that will calculate the equation for the line of best fit.

Why is this important? This equation can be used to calculate approximations of y for a value of x that is not given. In other words, we can make reasonable predictions.

Using a TI-83 or TI-84, we can make two Lists, L1 and L2 for the values of x and y respectively.

L1	L2	L3
40	170	-----
45	183	
32	151	
50	195	
37	162	
41	174	
30	141	
L1(1)=40		

We can now use the **Linear Regression** feature on the calculator

1. Press STAT
2. With cursor on EDIT – 1 – Press ENTER
3. Enter the data in L1 and L2
4. Press STAT again
5. Move to CALC
6. Move down to 4: LinReg(ax+b)
7. Press ENTER to Calculate
8. You will get:
 $y=ax+b$
 $a=2.623307544$
 $b=64.94148936$

There are 2 Computations Missing. To get those, clear the screen, Press 2nd – Catalog, go to Diagnostics On, Press ENTER and See Done.

Repeat the steps 4-8, and you will get:

$$y=ax+b$$

$$a=2.623307544$$

$$b=64.94148936$$

$$r^2=.992706712$$

$$r=.9963466826$$

The value of r is the **Correlation Coefficient**. The Coefficient of Correlation is always a number from -1 to 1 that measures how well a line fits the set of data pairs (x, y) . When r is close to 1, the points lie close to a line with a positive slope. When r is near -1, the points lie close to a line with a negative slope. When r is near 0, the points do not lie close to any line.

The value r^2 is the **Determination Coefficient**. The Coefficient of Determination is a measure of how well the regression line represents the data. If the regression line passes exactly through every point on the scatter plot, it would be able to explain all of the variation. The further the line is away from the points, the less it is able to explain.

Algebra 2A Assignment 104 Monday, September 14, 2015 Hour Name

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