Name KEY Block ____ Date ____

HONORS A 2 **Chapter 1 and 2a Review**

Vocabulary: Thoroughly explain each of the following terms within the context of this chapter:

Parent Function	Stretch	Line of Best Fit	Correlation
Transformation	Translation	Regression	Correlation Coefficient
Compression	Reflection		
Domain	Range		

Vertex Form of a Quadratic Function
Axis of Symmetry
Standard Form of a Quadratic Equation
Maximum or Minimum Value of a Quadratic

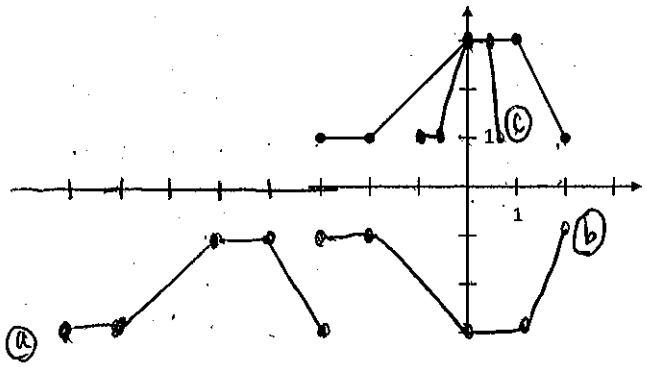
NO CALCULATOR ALLOWED

1. Perform the given translation to the graph shown.

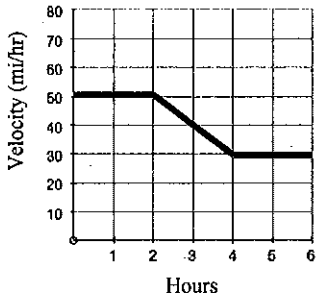
a) 5 units left, 4 units down

b) Reflection across the x-axis

c) Horizontal compression by a factor of $\frac{1}{3}$

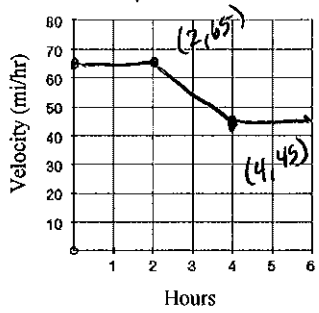


2. The following graph shows the velocity of a car over a 6 hour period. **Sketch** a new graph to represent each situation below and **identify** the transformation of the original graph that it represents.



a) The velocity is increased by 15 mi/hr.

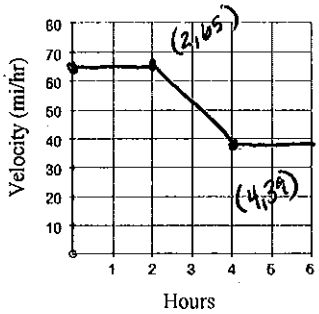
Up 15 $(x, y+15)$



b) The velocity is increased by 30%

vertical stretch by a factor of 1.3

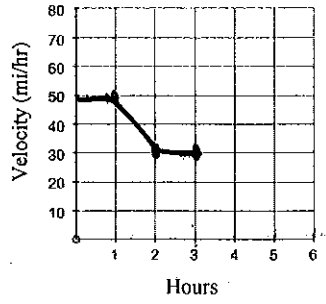
$(x, 1.3y)$



c) The time is decreased by half.

Horizontal compression by a factor of $\frac{1}{2}$.

$(\frac{1}{2}x, y)$



3. **Identify** the parent function for $g(x)$ from each equation below. **Then,** describe what transformation of the original function it represents. Graph $g(x)$ and give the domain and range.

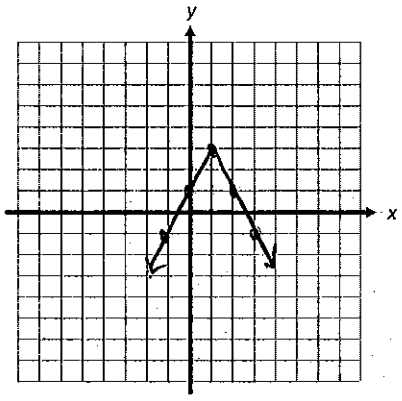
a) $g(x)=-2|x-1|+3$ Parent: $y=|x|$

$(x+1, -2y+3)$

Transformation:
Reflect over x-axis
Vertical Stretch by 2
Right 1, Up 3

Domain:
$\mathbb{R}$

Range:
$y \leq 3$



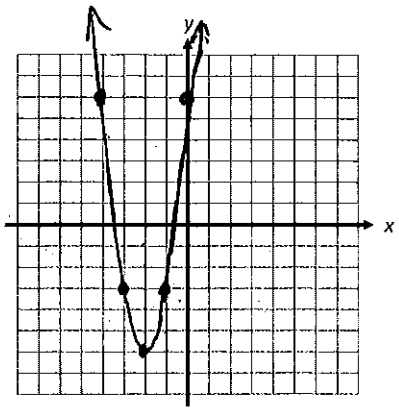
b) $g(x)=3(x+2)^2-6$ Parent: $y=x^2$

$(x-2, 3y-6)$

Transformation:
Vertical Stretch by 3
Left 2, Down 6

Domain:
$\mathbb{R}$

Range:
$y \geq -6$



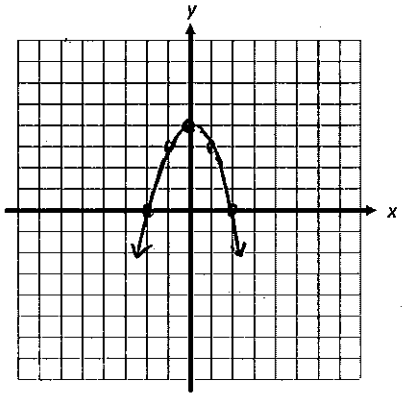
c) $g(x)=-x^2+4$ Parent: $y=x^2$

$(x, -y+4)$

Transformation:
Reflect over x-axis
Up 4

Domain:
$\mathbb{R}$

Range:
$y \leq 4$

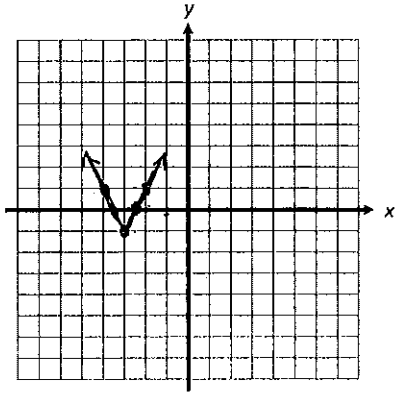


d) $g(x)=|2(x+3)|-1$ Parent: $y=|x|$

Transformation:
Horizontal Shrink by $\frac{1}{2}$
Left 3 Down 1

Domain:
$\mathbb{R}$

Range:
$y \geq -1$



4. Let $g(x)$ be the indicated transformations of $f(x)=|x|$. Write the equation of $g(x)$.

a) Reflection across the x-axis, vertical stretch by a factor of 9, horizontal translation 5 units left.

$g(x) = -9|x+5|$

b) A Horizontal stretch by a factor of $\frac{5}{3}$, vertical stretch by a factor of 3, right 7 and up 19.

$g(x) = 3\left|\frac{3}{5}(x-7)\right| + 19$

5. Let $k(x)$ be the indicated transformations of $h(x)=x^2$. Write the equation for $k(x)$.

a) Horizontal stretch by a factor of $\frac{4}{3}$, vertical compression by a factor of $\frac{2}{5}$, and a vertical translation 8 up.

$k(x) = \frac{2}{5}\left(\frac{3}{4}x\right)^2 + 8$

b) Horizontal compression by a factor of $\frac{7}{10}$, a vertical stretch by a factor of 8, 14 down, and 12 right.

$K(x) = 8\left(\frac{10}{7}(x-12)\right)^2 - 14$

6. Consider the function $g(x) = -\frac{1}{3}(x-5)^2 + 8$

a) What is the line of symmetry for $g(x)$?

$x = 5$

b) What is the vertex of $g(x)$.

$(5, 8)$

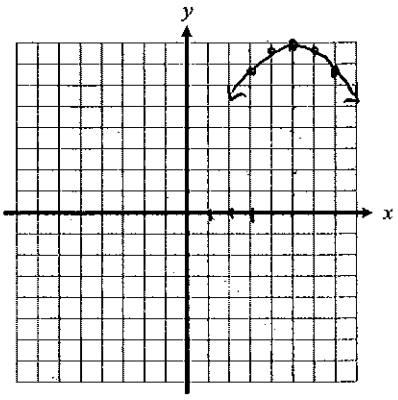
c) Does $g(x)$ open up or down? Explain.

Down b/c $a = -1/3 < 0$

d) Graph $g(x)$

$(x+5, -\frac{1}{3}y + 8)$

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



e) Does $g(x)$ have a maximum or a minimum? Explain.

MAX b/c it opens Down

f) What is the maximum (or minimum) of $g(x)$.

MAX = 8

g) What is the domain and range of $g(x)$?

D: $\mathbb{R}$ R: $y \leq 8$

7. Consider the function $h(x) = 2x^2 + 12x + 11$.

a) Find the line of symmetry $x = -3$

$x = -b/2a = \frac{-12}{2(2)} = \frac{-12}{4} = -3$

b) Find the vertex

$h(-3) = 2(-3)^2 + 12(-3) + 11$

$h(-3) = 2(9) + 12(-3) + 11$

$h(-3) = 18 - 36 + 11$

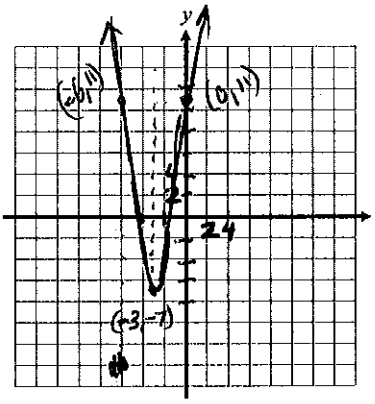
$h(-3) = -7$

$(-3, -7)$

c) Find the y-intercept

y-int = 11

d) Graph the function including at least 3 points.



WATCH scale... I counted by 2's!

e) What is the domain and range of $h(x)$?

D: $\mathbb{R}$

R: $y \geq -7$

For questions 8 – 10, identify the parent function equation and the transformation(s).

8. $g(x) = (x+3)^3$

Parent: $y = x^3$

LEFT 3

9. $h(x) = \sqrt{x-4}$

Parent: $y = \sqrt{x}$

Right 4

10. $k(x) = x^2 + 3$

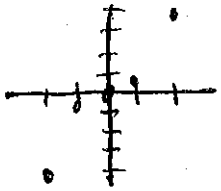
Parent: $y = x^2$

Up 3

For questions 11 and 12, identify the parent function that best approximates the data set.

11.

x	−2	−1	0	1	2
y	−4	−0.5	0	0.5	4

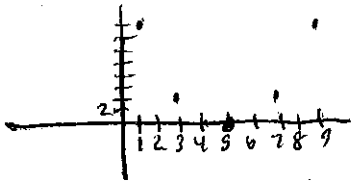


CUBIC

$Y = x^3$

12.

x	1	3	5	7	9
y	16	4	0	4	16

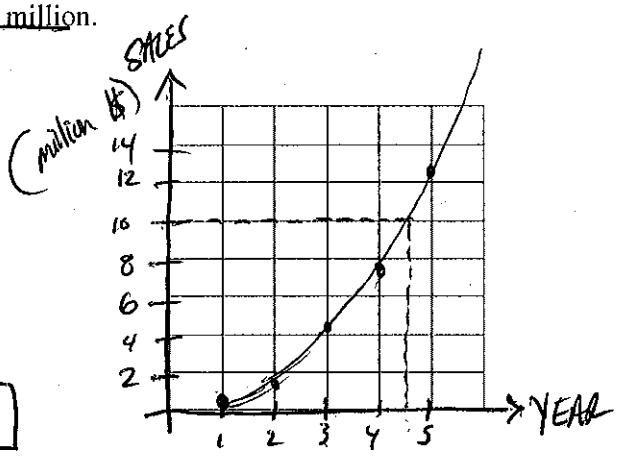


QUADRATIC

$Y = x^2$

13. Graph the relationship from year to sales in millions of dollars and identify which parent function best describes it. Then ***use the graph*** to estimate when cumulative sales reached $10 million.

Year	1	2	3	4	5
Sales (million $)	0.6	1.8	4.2	7.8	12.6



Draw your best effort curve...

QUADRATIC

$Y = x^2$

Find when $Y = 10$ ON THE CURVE ... ≈ 4.5 years

CALCULATOR ALLOWED

14. Consider the function $g(x) = -0.28x^2 + 84x + 5$.

a) Does this function have a maximum or a minimum? Explain.

opens down b/c $a < 0$ so it has a MAX

b) Find the maximum (or minimum) of the function.

By "hand" ... $x = -b/2a = \frac{-84}{2(-.28)} = 150$

$g(150) = -.28(150)^2 + 84(150) + 5 = 6305$

MAX = 6305

c) What is the domain and range of this function?

D: $\mathbb{R}$ R: $y \leq 6305$

15. If the points in a scatterplot have positive correlation, then the r-value is POSITIVE.

16. If the points in a scatterplot have negative correlation, then the r-value is NEGATIVE.

17. If the equation of the line of best fit is $y = 7.013 - 0.12x$, which of the following could be the r-value?

A) 1.08 B) 0.76 C) −0.89 D) −1.35

Line has negative slope

⇒ r-value must be negative (eliminates A & B)

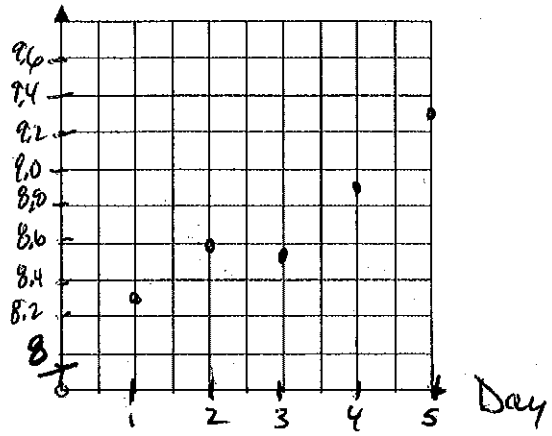
r cannot be less than −1 or bigger than 1 (eliminates D)

18. The table shows the price of a technology stock over 5 days.

$X = L_1$
$Y = L_2$

Day	1	2	3	4	5
Price ($)	8.30	8.60	8.55	8.90	9.30

a) Make a scatterplot of the data. ✓



b) Find the line of best fit for the data.

LinReg L_1, L_2

$Y = .23x + 8.04$

c) Find the correlation coefficient.

$r \approx .948504013 7$

d) What does the slope of the line you found in part *b* represent in the context of this problem?

$\text{Slope} = \frac{\Delta \text{Price (\$)}}{\Delta \text{ Days}}$ Price is going up \$.23/day

e) Using your equation from part *b*, predict the price of the technology stock in two weeks. = 14 Days = X
How accurate do you think your prediction is?

$Y = .23(14) + 8.04$
$Y = 11.26$

f) Using your equation from part *b*, predict the day the price will hit \$25. = Y
How accurate do you think your prediction is?

$25 = .23x + 8.04$
$16.96 = .23x$
$73.73913043 = x$

$x \approx 73.739$ Days

[Optional] Need More Practice? ... Try the following from your textbook ...

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Page 44 #9 – 11

Page 45 #17

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