

Honors PreCalculus Summer Packet

Work must be shown to support each answer and should be done neatly. Please circle the answers. The first assessment for the quarter will be based on the problems in this summer packet.

I. Find the equation of a line in slope-intercept form given the following information:

1. through $(5, -1)$ and $(0, 4)$	2. slope of $\frac{3}{2}$ and passes through $(2, 4)$
3. through $(-1, -1)$ and parallel to $y = -x - 5$	4. through $(5, -3)$ and perpendicular to $y = \frac{5}{2}x$
5. $f(-2) = 1$ and $f(-1) = 3$	6. through $(2, -4)$ and parallel to $x = 5$

II. The average monthly cellular phone bills y (in dollars) for subscribers in the IS from 1990-1999, where x is the year, are shown as data points.

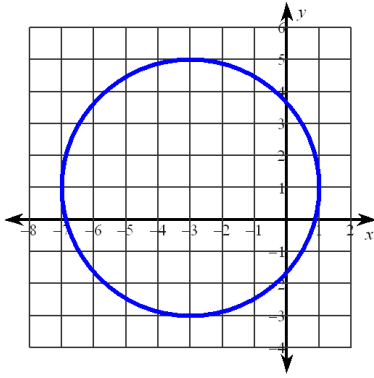
$(1990, 80.90)$	$(1995, 51.00)$
$(1991, 72.74)$	$(1996, 47.70)$
$(1992, 68.68)$	$(1997, 42.78)$
$(1993, 61.48)$	$(1998, 39.43)$
$(1994, 56.21)$	$(1999, 41.24)$

a. Find the linear regression that models this data. Round to the nearest hundredth.

b. Use the model to predict the average monthly cell phone bill in 2012.

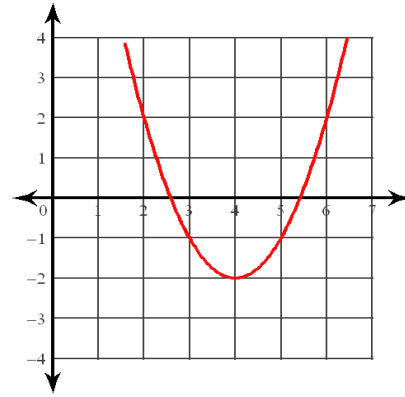
III. State the domain and range of the following relations:

1.



Domain: _____ Range: _____

2.



Domain: _____ Range: _____

3. $\{(-2,3), (-1,0), (-4,5), (1,5), (2,7)\}$

D_x : _____ R_y : _____

4. $x = -2$

D_x : _____ R_y : _____

IV. Use the graph below to find the following:

a) Domain:	b) Range:	
c) $f(-2)$:	d) $f(0)$:	
e) $f(2)$:	f) Interval(s) increasing:	
g) Interval(s) decreasing:	h) Interval(s) constant:	
i) x-intercept(s):	j) y-intercept:	
	k) When is $f(x) > 0$?	

V. Evaluate each function.

1. If $f(a) = a^2 - 3a + 6$, find :

a. $f(-3)$

b. $f(x + 2)$

c. $f(2\sqrt{3})$

2. If $g(n) = -3n - 4$ and $h(n) = n^2 - n$, find $g(h(6))$

3. If $f(x) = 4x + 3$ and $g(x) = x^2 + 2x + 3$, find:

a. $f(x) + g(x)$	b. $f(x) - g(x)$
c. $f(x) \cdot g(x)$	d. $g(f(x))$

VI. Given $f(x)$, find the inverse function.

1. $f(x) = \frac{1}{2}x - 3$	2. $f(x) = x^3 + 4$
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VII. Find the domain algebraically. Write your answer in interval notation.

1) $y = \sqrt{x^2 - 16}$	2) $y = \frac{4x}{x^2 + 2x - 15}$
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3) $y = \frac{3}{\sqrt{x-5}}$	4) $\sqrt{x^2 + 3}$
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VIII. Find the zeroes of the following by solving for x when $y = 0$.

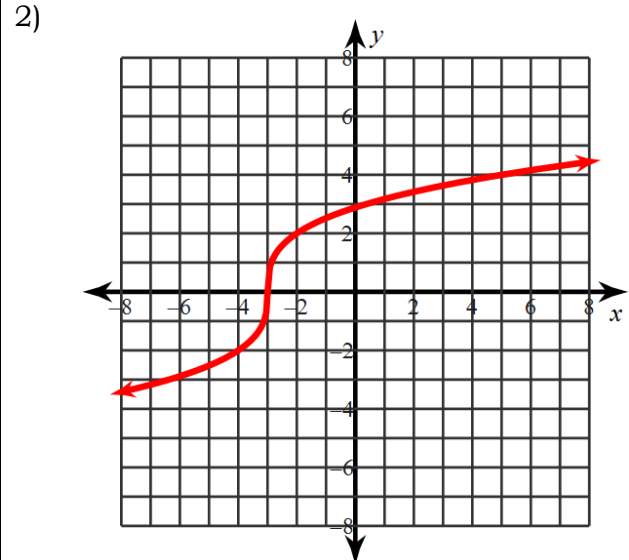
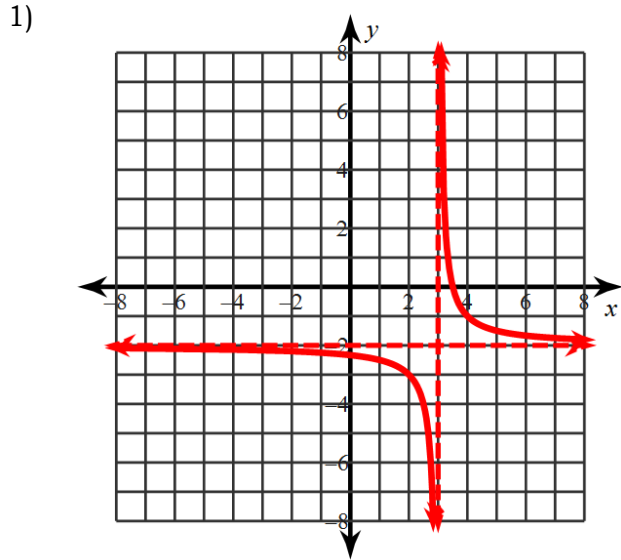
1) $y = 3x - 7$	2) $y = x^2 - 14x + 45$
3) $y = x(x + 1)(2x - 5)(x - 3)^2$	4) $y = x^2 - 12$
5) $y = x^4 - 7x^2 + 12$	6) $y = x^3 + 4x^2 - 3x - 12$
7) $y = 2x^3 + 5x^2 - 6x - 15$	8) $y = \frac{1}{x}$

IX. Write the equation of the described transformation.

1) A cubic function shifted right 3 units and down 4 units

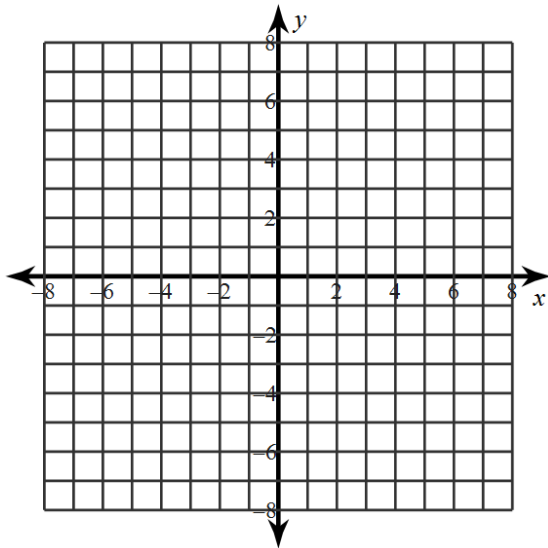
2) An absolute value function vertically compressed by a factor of $1/3$, reflected over the x -axis.

X. Write the equation of the transformed graph.

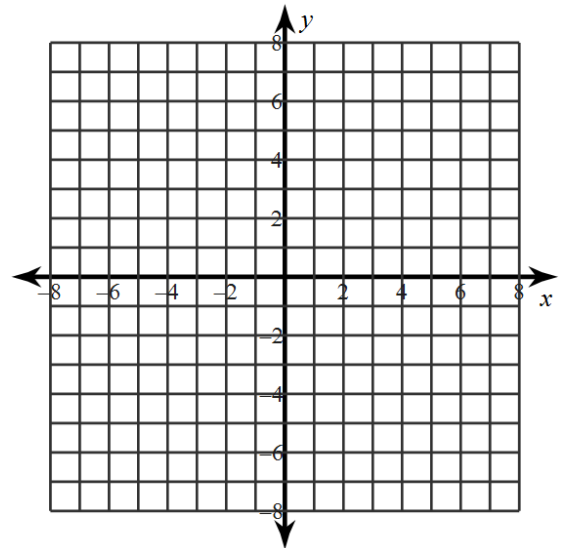


XI. Sketch the graph of the function using transformations.

1) $f(x) = -\sqrt{-x + 4}$



2) $f(x) = \frac{1}{2}(x + 1)^2 - 3$



XII. Given the equation $f(x) = (x + 2)^2 - 1$, find:

1. Vertex: _____

2. Axis of Symmetry: _____

3. Direction: _____

4. Max or Min Value: _____

5. x intercept: _____

6. y- intercept: _____

XIII. The height of a ball thrown vertically upward from ground level is $h(t) = -32t^2 + 64t$, where t is the time in seconds and h is the height.

1. Find the height when $t = .5$
2. Find the time when the ball reaches its maximum height. (Hint: Find the vertex)
3. What is the maximum height?
4. After what time does the ball hit the ground? (Hint: Find t when $h(t) = 0$)

XIV. Solve each equation.

1. $2^5 = 2^{3x-1}$	2. $3^x = \frac{1}{81}$	3. $4^{x+2} = 8^{2x-3}$
4. $x^6 = 64$	5. $4x^{\frac{2}{3}} = 100$	6. $x^3 = \frac{1}{27}$
7. $4^x = 25$	8. $\log_4 x = -3$	9. $\log_7(x + 3) = 2$

