

**Honors PreCalculus Summer Packet 2020**

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.

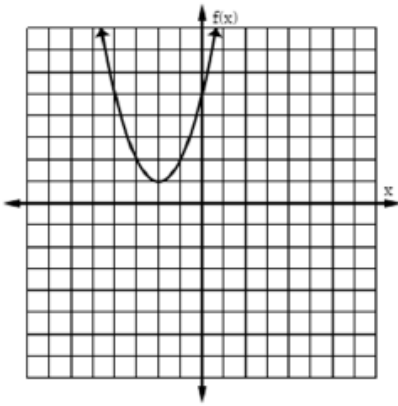
(1990, 80.90)	(1995, 51.00)
(1991, 72.74)	(1996, 47.70)
(1992, 68.68)	(1997, 42.78)
(1993, 61.48)	(1998, 39.43)
(1994, 56.21)	(1999, 41.24)

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 in interval notation. Then, determine if the relation represents a function.

1)

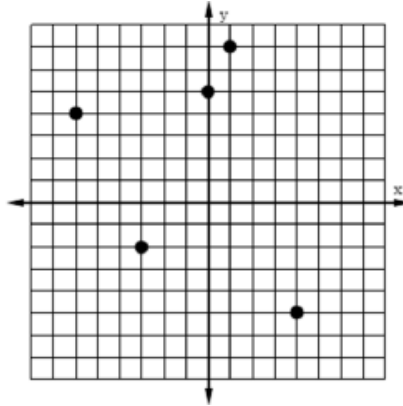


Domain: \_\_\_\_\_

Range: \_\_\_\_\_

Function? YES NO

2)

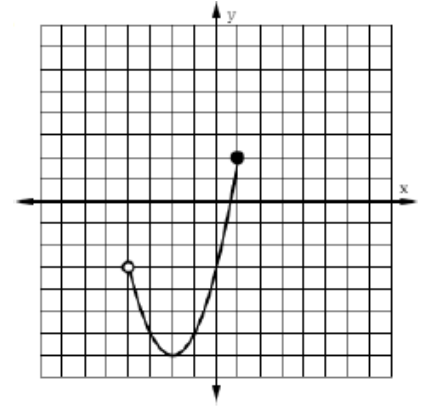


Domain: \_\_\_\_\_

Range: \_\_\_\_\_

Function? YES NO

3)

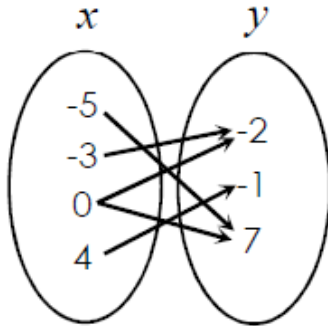


Domain: \_\_\_\_\_

Range: \_\_\_\_\_

Function? YES NO

4)

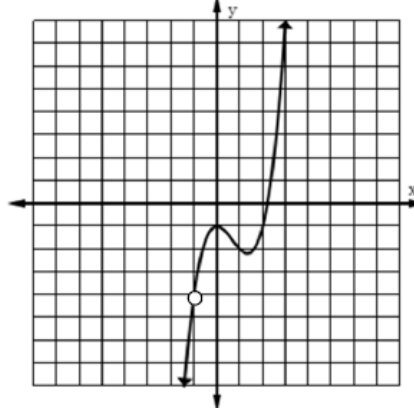


Domain: \_\_\_\_\_

Range: \_\_\_\_\_

Function? YES NO

5)

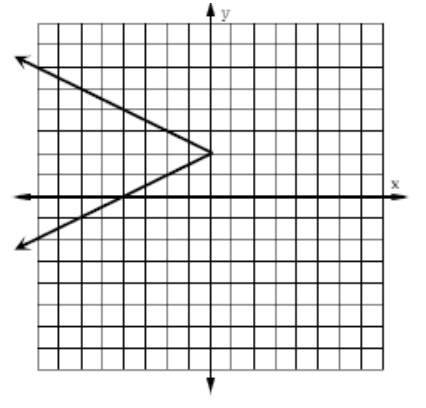


Domain: \_\_\_\_\_

Range: \_\_\_\_\_

Function? YES NO

6)



Domain: \_\_\_\_\_

Range: \_\_\_\_\_

Function? YES NO

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

Domain: \_\_\_\_\_

Range: \_\_\_\_\_

Function? YES NO

8)  $x = -2$

Domain: \_\_\_\_\_

Range: \_\_\_\_\_

Function? YES NO

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:	

V. Evaluate each function.

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

a.  $f(-3)$

b.  $f(x + 2)$

c.  $f(2\sqrt{3})$  (Leave answer in exact form)

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. $g(f(x))$

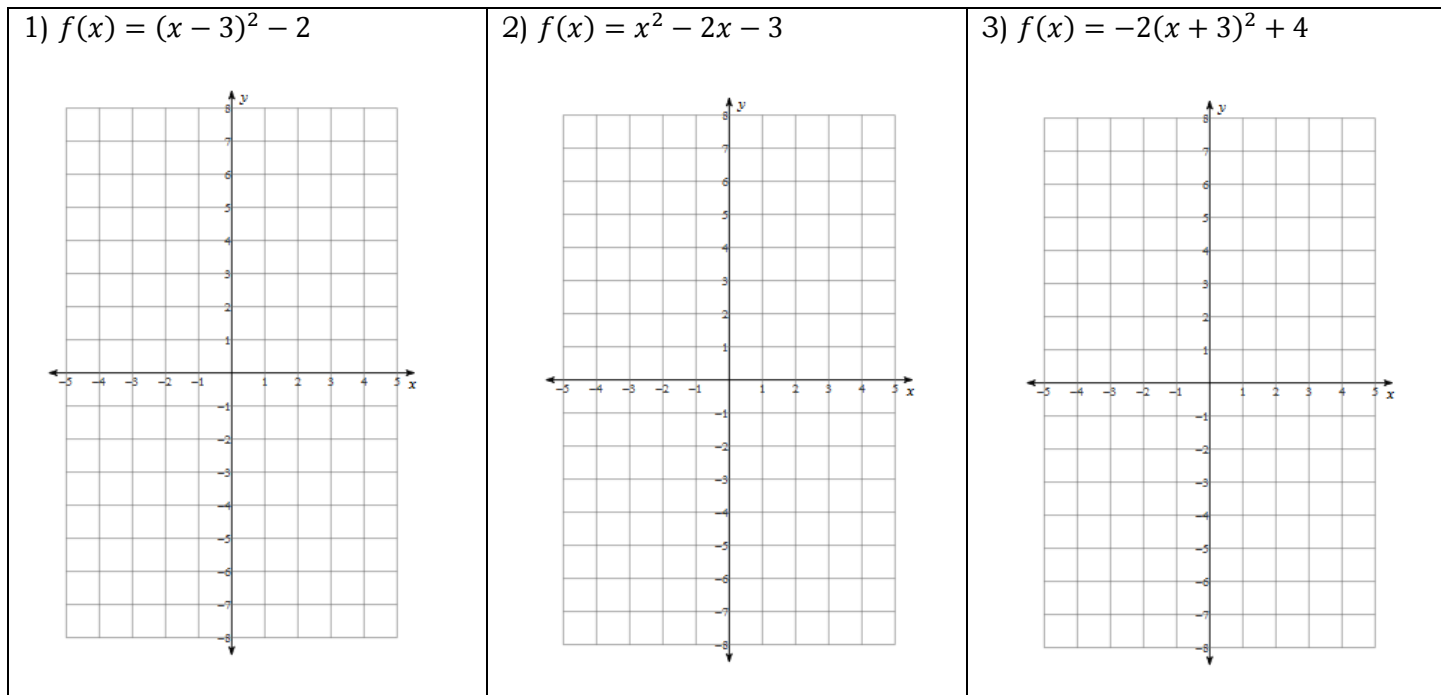
VI. Factor completely.

1) $f(x) = 3x^2 - 7x$	2) $f(x) = x^2 - 14x + 45$
3) $f(x) = x^2 + 5x + 6$	4) $f(x) = x^2 - 16$
5) $f(x) = x^4 - 7x^2 + 12$	6) $f(x) = x^3 + 4x^2 - 3x - 12$
7) $f(x) = 2x^3 + 5x^2 - 6x - 15$	8) $f(x) = 4x^2 - 81$
9) $f(x) = 3x^2 - 17x - 6$	10) $f(x) = 3x^2 - 27$
11) $f(x) = x^3 - 3x^2 - 10x$	12) $f(x) = 4x^2 + 9x - 9$
13) $f(x) = x^3 - 4x^2 + 2x - 8$	14) $f(x) = 12x^2 + 25x - 7$

VII. 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: \_\_\_\_\_

VIII. Graph each parabola.



IX. 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  $h(t) = 0$ )