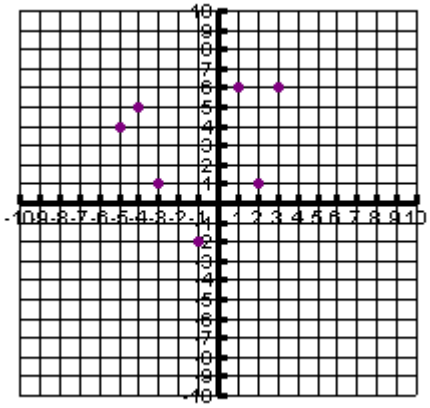
1.

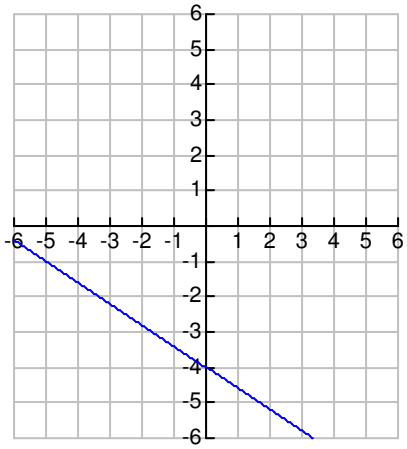
a. Make a mapping of the following relation.
b. State the relation as a set of ordered pairs.
c. State the domain of the relation.
d. State the range of the relation.
e. Is the relation a function?
f. State the inverse as a set of ordered pairs.
g. Is the inverse a function?



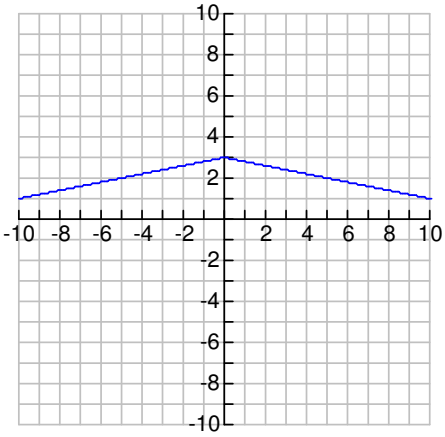
2. For each of the graphs below:

a. State the vertical stretch or compression
b. Reflection?
c. State the phase shift
d. State the vertical shift.
e. Name the Parent function
f. State the domain
g. State the range
h. Write the equation

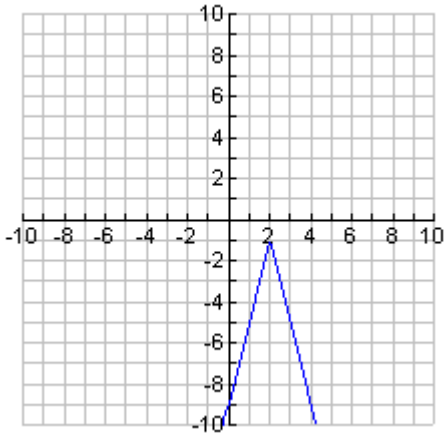
1.



2.



3.



3. For the following functions:

a. Graph b. Name the parent function c. State the domain d. State the range

1. $y = -3(x+3) - 3$
2. $y = -2(x+3)^2 + 6$
3. $y = -5|x-2| + 1$

4. Factor the following problems completely. If not factorable using integers, write 'prime'.

a. $27x^3 - 1$
b. $2x^{2a} + 11x^a y^b - 6y^{2b}$
c. $16x^2 + 10x - 21$
d. $2x^2 - 13x + 15$
e. $3x^2 + 17x - 28$
f. $24x^4 + 68x^3 + 48x^2$
g. $8x^2y + 4xy - 6xy^2 - 3y^2$
h. $25x^4 - 16y^2$
i. $36x^2 - 81y^4$
j. $x^4 - 18x^2 + 81$
k. $6ab - 3b + 2a - 1$

5. Solve using the zero product property.

a. $3x^2 - 13x - 10 = 0$ b. $2x^2 - 13x = -20$ c. $k^2 - 7k + 10 = 0$

6. Solve by any method.

a. $m^2 - 5m + 6 = 0$ b. $6b^2 = 12b - 3$ c. $x^2 - 8x = -9$

e. $x^2 + 3x - 5 = 0$ f. $3x^2 - 8x + 2 = 0$ 9. g. $9x^2 - 12x + 4 = 0$

7. Graph the following. Give the x and y-intercepts and the coordinates of the vertex:

a. $f(x) = x^2 - 5x + 6$ b. $f(x) = 2x - x^2$

8. A personal trainer at a local gym charges the following fees for a one-hour training session for 1 to 4 people.

Number of People	1	2	3	4
Cost ($)	20	24	28	32

Which equation best represents the relationship between n, the number of people, and c, the cost?

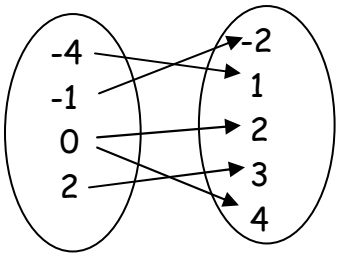
A $n = c + 19$

B $c = 20n$

C $c = 4n + 16$

D $c = 5n + 14$

9. Use the mapping to answer the following.



Relation:
Domain:
Range:
Function?
Inverse:
Is the inverse a function?

10. Write a "rule" for each relation.

a.

x	y
-5	-18
-3	-8
-1	2
1	12

b.

x	y
-2	-8
-1	-6
0	-4
1	-2

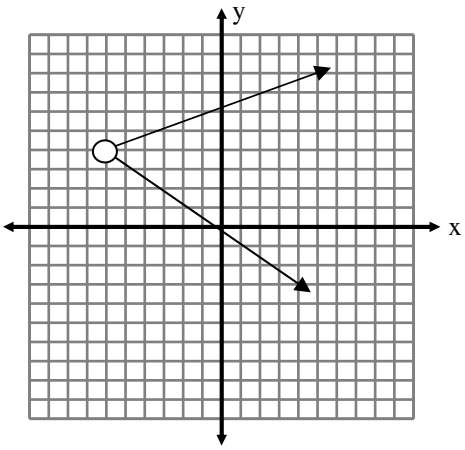
11. Determine if each relation is a function. State the domain and range.

a.

_____ a. Domain

_____ b. Range

_____ c. Function?

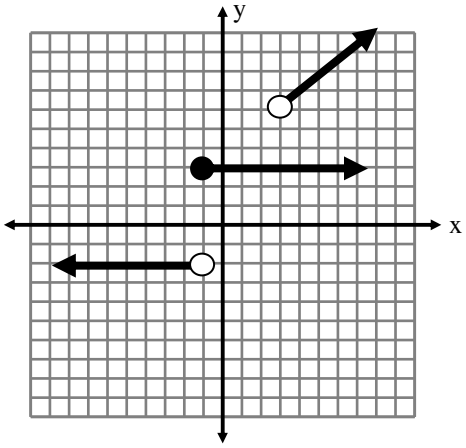


b.

_____ a. Domain

_____ b. Range

_____ c. Function?



12. Given f(x) = 1 – x^2 and $g(x)=\frac{1}{2}x+\frac{5}{3}$ find the function values. You must show work.

a. $f(h^2 - 3)$ b. $g\left(\frac{3}{5}\right)$ c. f(5 + h) - f(-3)

13. Find the first four terms of the sequence $a_n = -2n+3$

14. Identify which of the following are arithmetic sequences or geometric sequences and provide a rule.

a. $\{8, 12, 16, 20, 24, ...\}$ b. $\{1, -2, 4, -8, ...\}$

15. For the sequences in #13, find a_{10} and S_5

**Review your midterm