Board Problems Ch. 24

$$(x-h)^2 + (y-k)^2 = r^2$$

① Given the circles center $(3,2)$ and radius of 5.5, give h k equation of circle.

_____

GRAPHING FORM

_____

STANDARD FORM

② Given $x^2 - 8x + y^2 + 12y = -48$
   Find center and radius of circle

   $C = $ _____

   $R = $ _____

③ Given $4(x-1)^2 + 36(y+1)^2 = 36$
   Find the coordinates of the center & x and y extremities.

   $C = $ _____

$y = x^2$

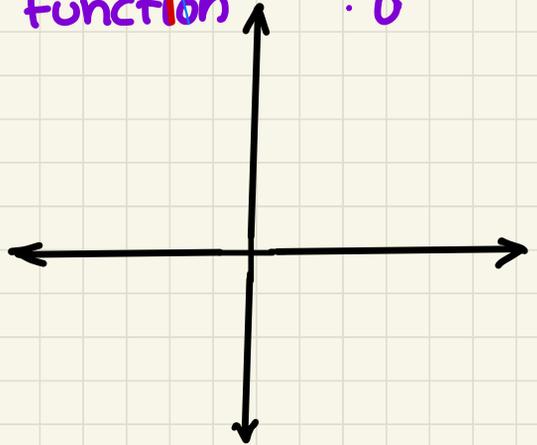graphing
quadratic
equations

$y = Ax^2$ parent function

T-chart Pick solve

X   Y

$y = 2x^2$

$y = \frac{1}{2}x^2$

$y = -x^2$

$y = Ax^2 + Bx + C$

A = changes stretch or compress
of the parabola

A > |1| _____ $y = 2x^2$
stretch =

0 < A < |1| _____
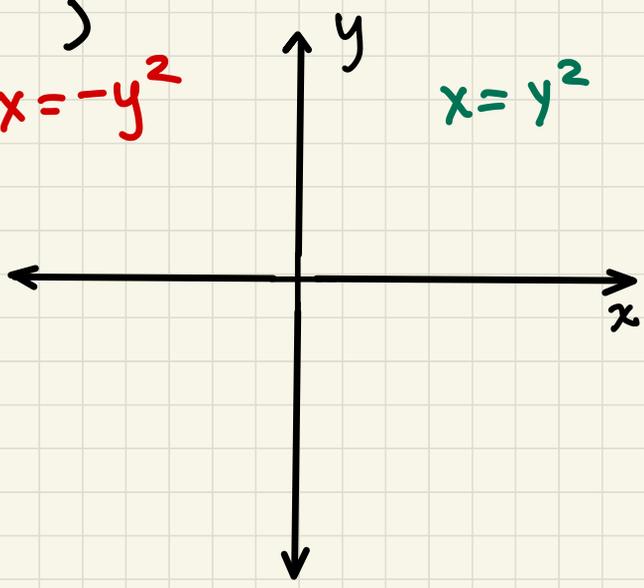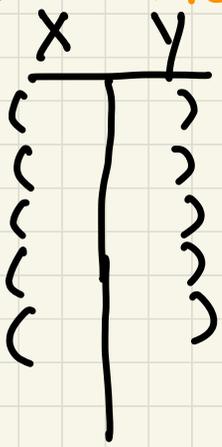
FLIP = _____

REVIEW OF TRANSFORMATIONS

1. y - stretch   y - compress
2. flip over x-axis

$X = y^2$

| X	y
(	)
(	)
(	)
(	)
(	)

$X = (\quad)^2$

$x = -y^2$

$x = y^2$

$y = x^2 + 1$

$y = Ax^2 + Bx + \boxed{C}$
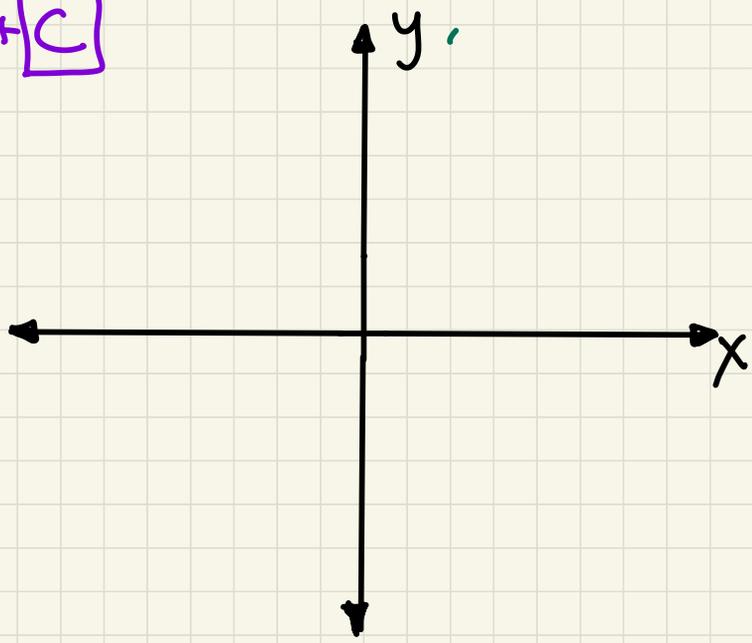
$y = -\frac{1}{2}x^2 - 2$

Not only can the graph become steeper, more spread out, or inverted; it can also move like a translation (See transformational geometry in the Geometry course.) For example: $Y = X^2 + 2$. See Figure 1. It is the same parabola, just moved, or translated, up 2 on the Y axis. If the term is a negative number the parabola would move down the Y axis. See Figure 2.

Figure 1

X	Y
0	2
1	3
-1	3
2	6
-2	6

$Y = X^2 + 2$

Figure 2

X	Y
0	-3
1	-2
-1	-2
2	1
-2	1

$Y = X^2 - 3$
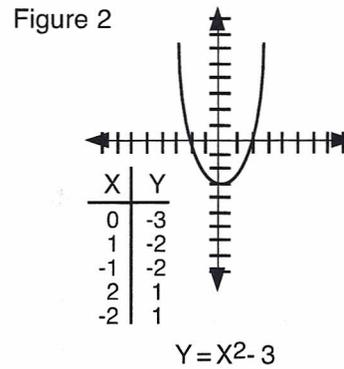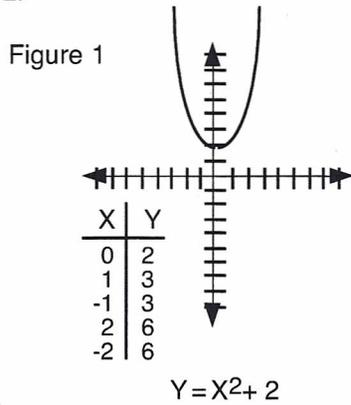
Practice Problems

Estimate what the graph should look like, then plot several points to confirm your hypothesis.

1) $Y = 2X^2 + 1$

2) $Y = 1/2X^2 + 3$

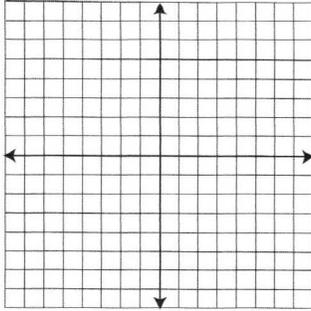3) $Y = -X^2 + 2$

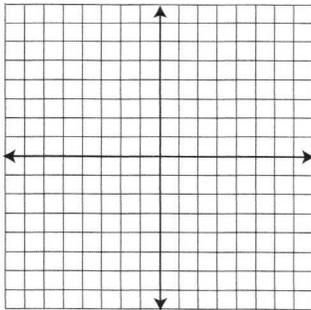4) $Y = -1/3X^2 + 1$

5) $X = 2/3Y^2 + 2$

6) $X = -2Y^2 - 1$
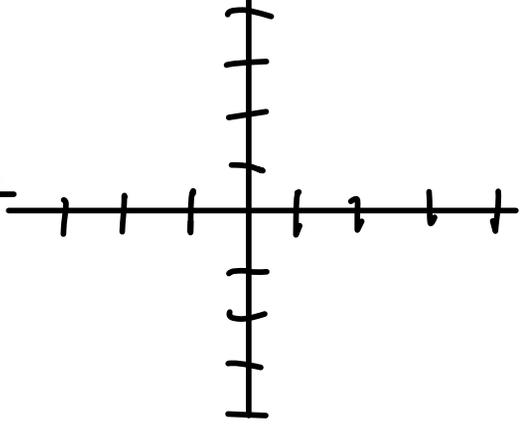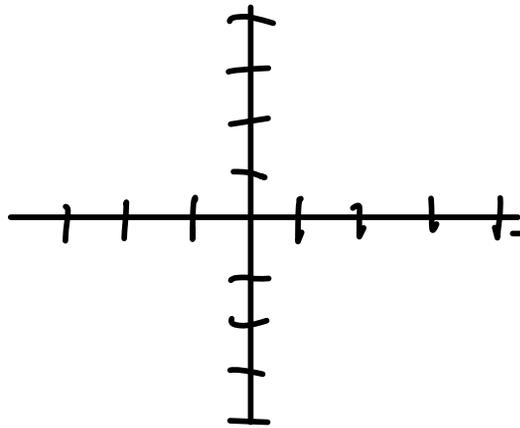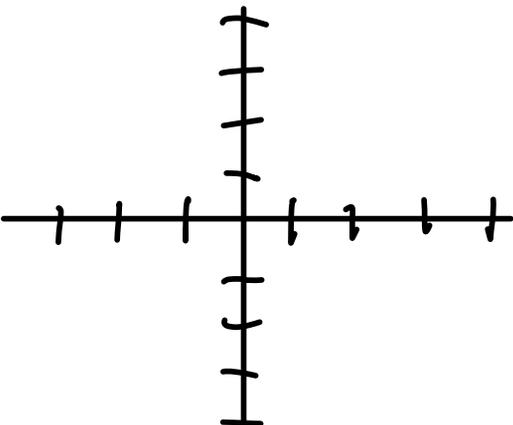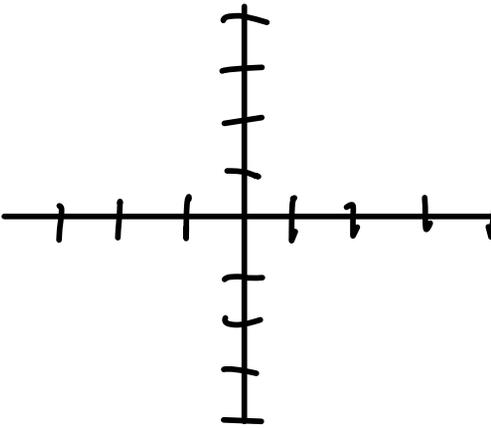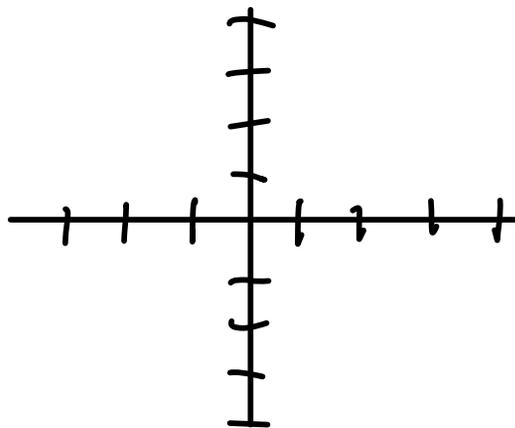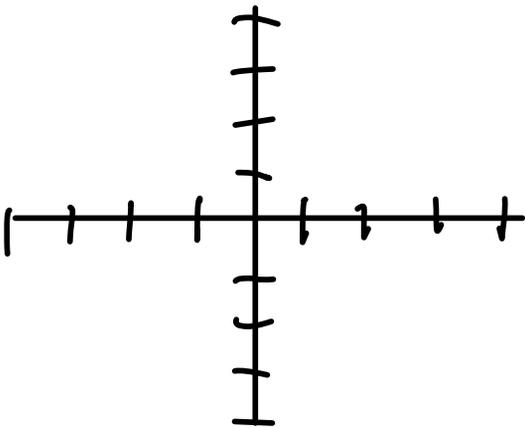
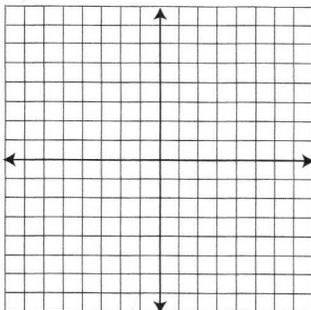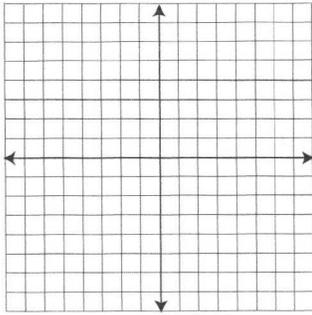Estimate each graph. Plot several points to confirm your estimate, and graph the parabola.

1. $Y = 3X^2$

2. $Y = -X^2$
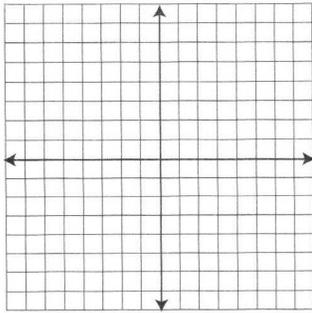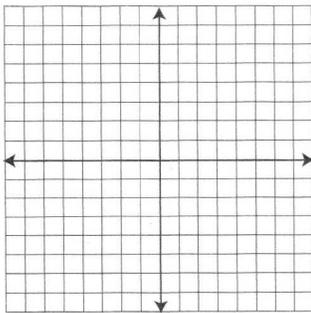
3. $Y = 1/3\ X^2$

4. $X = 4Y^2$

5. $X = -3Y^2 + 1$

6. $Y = X^2 - 4$

Follow the directions.

1. Estimate the graph of $2X^2 = -Y$.

2. Plot five points to confirm your hypothesis, and graph the figure.

3. Estimate the graph of $Y + 1 = 2X^2$.

4. Plot five points to confirm your hypothesis, and graph the figure.
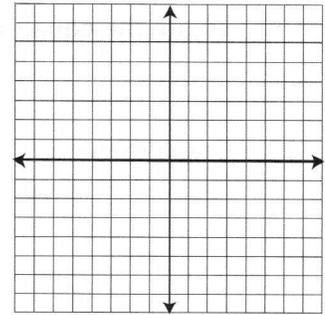
5. Estimate the coefficient of X^2 in parabola A.

6. Estimate the intercept of parabola A.

7. Estimate the coefficient of X^2 in parabola B.

8. Estimate the intercept of parabola B.
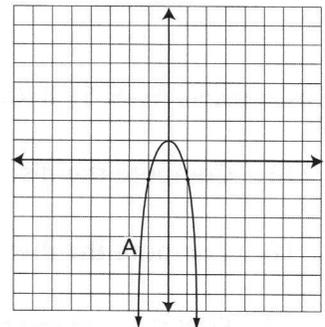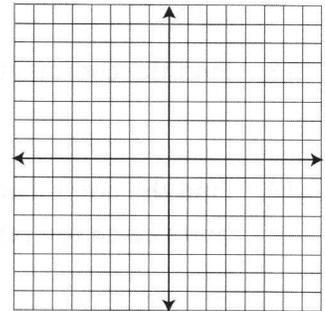
Given $1/2 \, X^2 + 1/2 \, Y^2 = 8$

9. Find the center and radius of the circle.

10. Graph the result.

11. Given the center (0, 2) and radius (3), create the equation of the circle.

12. Graph the result.

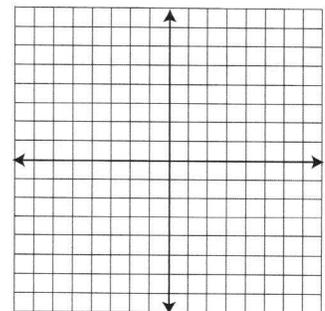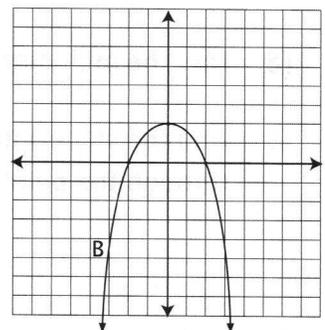Given $\dfrac{(X-1)^2}{16} + \dfrac{(Y+1)^2}{4} = 1$:

13. Find the coordinates of the center.

14. Find the coordinates of the X and Y extremities, and sketch the result.

Given points A(−5, 5), B (0, 4), and C (4, −3)

15. Compute the distance between points A and B.

16. Compute the distance between points A and C.

17. Find the midpoint between points B and C.

18. Find the midpoint between points A and B.

19. Find the slope/intercept formula of the line perpendicular to 4Y − X − 6 = 0, through the point (0, 3).

Follow the directions.

20. Graph Y > 4X − 3/2.

Name_____
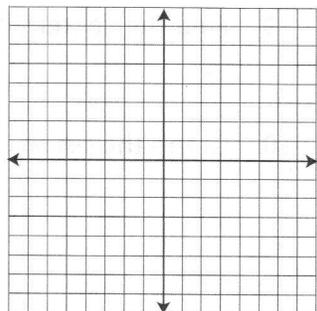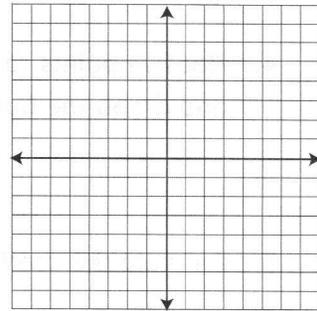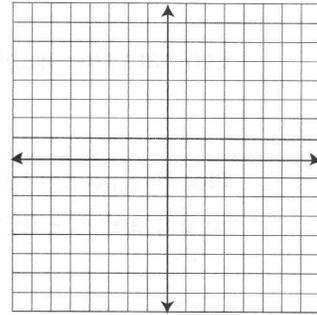
Function Operations

Date_____ Period____

Perform the indicated operation.

1) $g(n) = n^2 + 4 + 2n$
   $h(n) = -3n + 2$
   Find $(g \cdot h)(1)$

2) $f(x) = 4x - 3$
   $g(x) = x^3 + 2x$
   Find $(f - g)(4)$

3) $h(x) = 3x + 3$
   $g(x) = -4x + 1$
   Find $(h + g)(10)$

4) $g(a) = 3a + 2$
   $f(a) = 2a - 4$
   Find $\left(\dfrac{g}{f}\right)(3)$

5) $g(x) = 2x - 5$
   $h(x) = 4x + 5$
   Find $g(3) - h(3)$

6) $g(a) = 2a - 1$
   $h(a) = 3a - 3$
   Find $(g \cdot h)(-4)$

7) $g(t) = t^2 + 3$
   $h(t) = 4t - 3$
   Find $(g \cdot h)(-1)$

8) $g(n) = 3n + 2$
   $f(n) = 2n^2 + 5$
   Find $g(f(2))$

9) $g(x) = -x^2 - 1 - 2x$
   $f(x) = x + 5$
   Find $(g - f)(x)$

10) $f(x) = 3x - 1$
    $g(x) = x^2 - x$
    Find $\left(\dfrac{f}{g}\right)(x)$

11) $g(a) = -3a - 3$
    $f(a) = a^2 + 5$
    Find $(g - f)(a)$

12) $h(t) = 2t + 1$
    $g(t) = 2t + 2$
    Find $(h - g)(t)$

13) $f(x) = 2x^3 - 5x^2$
$g(x) = 2x - 1$
Find $(f \cdot g)(x)$

14) $h(n) = 4n + 5$
$g(n) = 3n + 4$
Find $(h - g)(n)$

15) $g(a) = -3a^2 - a$
$h(a) = -2a - 4$
Find $\left(\dfrac{g}{h}\right)(a)$

16) $f(n) = 2n$
$g(n) = -n - 4$
Find $(f \circ g)(n)$

17) $h(a) = 3a$
$g(a) = -a^3 - 3$
Find $\left(\dfrac{h}{g}\right)(a)$

18) $g(n) = 2n + 3$
$h(n) = n - 1$
Find $(g \circ h)(n)$

19) $h(x) = x^2 - 2$
$g(x) = 4x + 1$
Find $(h \circ g)(x)$

20) $g(t) = 2t + 5$
$f(t) = -t^2 + 5$
Find $(g + f)(t)$

21) $g(x) = 2x - 2$
$f(x) = x^2 + 3x$
Find $(g \circ f)(-2 + x)$

22) $g(a) = 2a + 2$
$h(a) = -2a - 5$
Find $(g \circ h)(-4 + a)$