Name Key Date Block

Review ch 1-3

1. Determine if the point (2, 8) lies on the graph of the equation.

$y = \frac{1}{4}x^4 - 3x^3$ $\frac{1}{4}(2)^4 - 3(2)^3 = 8$

$-20 \neq 8$ No!

2. Determine the quadrant(s) in which (x,y) is located so that the condition(s) is (are) satisfied.

$x < -8$ and $y > 0$ II

3. Find the coordinates for the point that is two units to the right of the *y*-axis and is five units up from the *x*-axis.

(2, 5)

4. Find the midpoint and distance between the two points (−5, 14) and (−3, 6).

x_1, y_1 x_2, y_2

$M\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right) \Rightarrow \left(\frac{-5+-3}{2}, \frac{14+6}{2}\right) \Rightarrow \left(\frac{-8}{2}, \frac{20}{2}\right) \Rightarrow \boxed{(-4, 10)}$

$d = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$

$d = \sqrt{(-3+5)^2+(6-14)^2}$

$d = \sqrt{(2)^2+(-8)^2}$

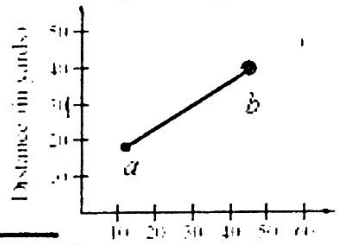
$d = \sqrt{4+64}$

$d = \sqrt{68}$

5. A soccer player passes the ball from a point that is 12 yards from the endline and 16 yards from the sideline. The pass is received by a teammate who is 50 yards from the same endline and 39 yards from the same sideline, as shown in the figure. How long is the pass? Round to the nearest tenths

a: (12, 16)

b: (50, 39)



$d = \sqrt{(50-12)^2+(39-16)^2}$

$d = \sqrt{(38)^2+(23)^2} = \sqrt{1973} \approx 44.4$ yards

6. Original coordinates of vertices (6,2) Shift: six units downward, three units to the left

$(6,2) \Rightarrow (3,-4)$

$-3 \quad -6$

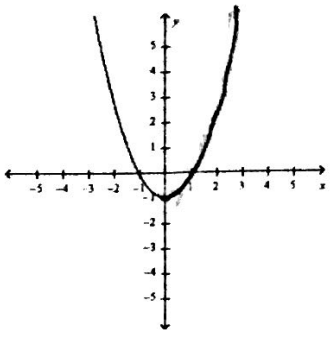
7. Write the equation of a circle in standard form with center (0,-4) and radius 7

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

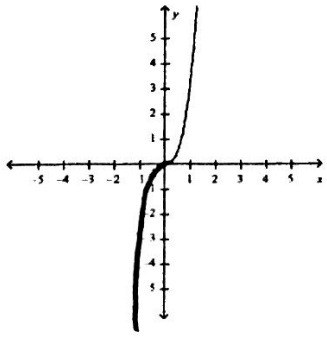
$(x-0)^2+(y-(-4))^2 = 7^2 \Rightarrow x^2+(y+4)^2 = 49$

8. Complete the graph of the of the equation with the given

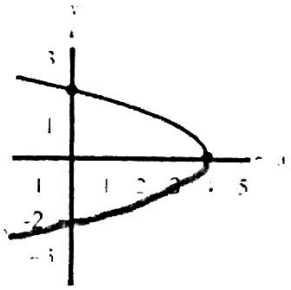
y axis



origin



x xis



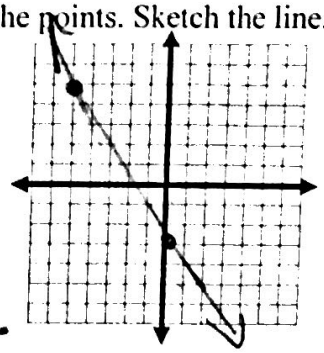
9. Find the slope-intercept form of the equation of the line passing through the points. Sketch the line.

(0,-3), (-5,5)

↑ y intercept

$m = \frac{-8}{5}$

$y = -\frac{8}{5}x - 3$



10. Write the equation of the line with slope 2/3 and y intercept -5

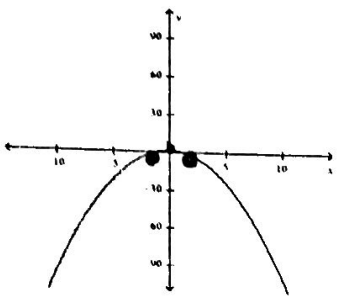
$y = \frac{2}{3}x - 5$

11. find the slope of the line given (-6,8) (5,-2)

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-2-8}{5--6} = \frac{-10}{11}$

12. Find the x- and y-intercepts of the equation below

$y = 1 - x^2$



$y = 1 - x^2$

$y = 1 - 0^2$ plug in for x

$y = 1 - 0$

$y = 1$

$(0, 1)$

$0 = 1 - x^2$

$-1 = -x^2$

$1 = x^2$

$\pm\sqrt{1} = x$

$(\pm\sqrt{1}, 0)$

$(\pm 1, 0)$

13. Use algebraic tests to check the following for symmetry with respect to the axes and the origin.

a) $10x - 10y^{14} = 0$ X-axis

$10x - 10(-y)^{14} = 0$

$10x - 10y^{14} = 0$ ✓

b) $x - y^4 + y^2 = 0$ X-axis

$x - (-y)^4 + (-y)^2 = 0$

$x - y^4 + y^2 = 0$ ✓

c) $y = x^8 + 2x^4 - 12$ y-axis

$y = (-x)^8 + 2(-x)^4 - 12$

$y = x^8 + 2x^4 - 12$ ✓

d) $y = 3x^3$ origin

$-y = 3(-x)^3$

$-y = -3x^3$

$y = 3x^3$ ✓

14. Determine whether the lines are parallel, perpendicular, or neither.

L1: $y = \frac{1}{3}x - 6$

L2: $y = \frac{1}{3}x - 3$

same slope parallel

15. Write the slope-intercept form of the equation of the line through the given point perpendicular to the given line.

point: (–5, 7)

x y

line: $6x - 18y = 8$

$-18y = 8 - 6x$

$y = \frac{8}{-18} - \frac{6x}{-18}$

$y = \frac{4}{-9} + \frac{1}{3}x$

$m = \frac{-3}{1}$

$y - 7 = -3(x - -5)$

$y - 7 = -3(x + 5)$

$y - 7 = -3x - 15$

$y = -3x - 8$

$y = mx + b$

$7 = -3(-5) + b$

or $7 = 15 + b$

$b = -8$

16. Complete the table.

$f(x) = x^3 + x - 1$

x	-3	-2	0	1	4
$f(x)$	-31	-11	-1	1	67

$(-3)^3 + (-3) - 1$

$(-2)^3 + (-2) - 1$

$(0)^3 + (0) - 1$

$(1)^3 + (1) - 1$

$(4)^3 + (4) - 1$

17. Show that the points form the vertices of the indicated polygon.

Isosceles triangle: (6,4), (3,9), (8,6) yes

$d = \sqrt{(6-3)^2+(4-9)^2} = \sqrt{34}$

$d = \sqrt{(6-8)^2+(4-6)^2} = \sqrt{8}$ yes

$d = \sqrt{(3-8)^2+(9-6)^2} = \sqrt{34}$

Right triangle: (2,1), (4,0), (5,7) yes

$d = \sqrt{(2-4)^2+(1-0)^2} = \sqrt{5}$

$d = \sqrt{(2-5)^2+(1-7)^2} = \sqrt{45}$

$d = \sqrt{(4-5)^2+(0-7)^2} = \sqrt{50}$

$(\sqrt{5})^2 + (\sqrt{45})^2 = (\sqrt{50})^2$ ✓

18. Find the center and radius of the circle for the following: a) $(x-7)^2+(y+9)^2 = 16$

center (7, -9)

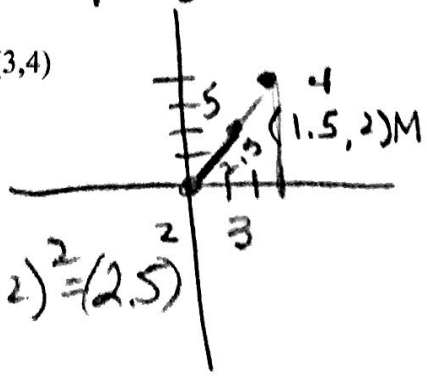
r = 4

b) $x^2+y^2 = 36$

center (0,0)

r = 6

19. Write the equation of the circle with endpoints (0,0) and (3,4)
(State the center and radius of the circle too)



center (1.5, 2)

"midpt"

diameter = 5

radius = 2.5

$(x-1.5)^2+(y-2)^2 = (2.5)^2$

20. Multiply:

a. (4x-5)(6x-9)

$24x^2-30x-36x+45$

$24x^2-66x+45$

b. (x-2)(x+3)

$x^2-2x+3x-6$

x^2+x-6

21. Factor:

a. x^2-81 $(x-9)(x+9)$

b. $x^2-3x-28$ $(x-7)(x+4)$

c. $2x^2-5x-3$ $(2x+1)(x-3)$

d. $x^3-5x^2-2x+10$ ← typo

$x^2(x-5)-2(x-5)$

$(x-5)(x^2-2)$