COLLEGE ALGEBRA EXAM 2 GG2 R^2 NAME _____

SHOW ALL WORK ON THIS TEST OR ON SEPARATE PAPER. Circle answers.

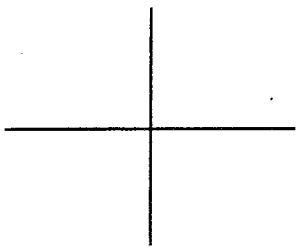
TURN IN ALL WORKSHEETS. CALCULATORS ARE REQUIRED ON THIS TEST.

1. Given the points (-4, 3) and (2, -1), find:

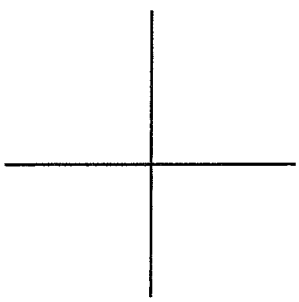
   a) midpoint b) slope c) distance

2. Find the equation (in standard form) of the perpendicular bisector of (-4, 3) and (2, -1). [Hint: use results of #1.]

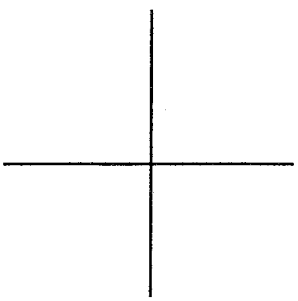
3. Sketch the graph of a) $Y = |X|$



b) $Y = |X+2| + 4$

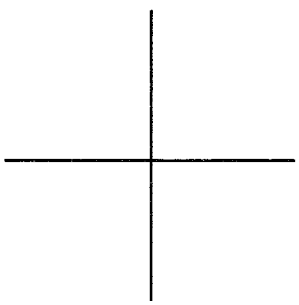


c) $Y = -|X-3|$



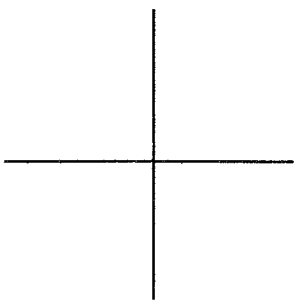
4. Find the vertex by completing the square. Sketch the graph.

$X = 2Y^2 + 8Y + 18$



5. Find the center and radius by completing the square. Sketch.

$X^2 + Y^2 + 4X - 10Y - 7 = 0$



6. Let $f(X) = \dfrac{4X - 2}{X + 2}$

a) f(2) =

b) f(-2) =

c) f(3X-7) =

7. Let $f(X) = \dfrac{X^2 - 4}{4X}$ and $g(X) = 5X + 2$

a) find f[g(X)] b) find g[f(X)]

8. Find the domain (give interval notation when appropriate):

a) $Y = \dfrac{X - 2}{X^2 - 6X}$ b) $Y = \dfrac{X - 3}{\sqrt{2 + X}}$ c) $Y = \sqrt{6 + 9X}$ d) $Y = X^2 - 16$

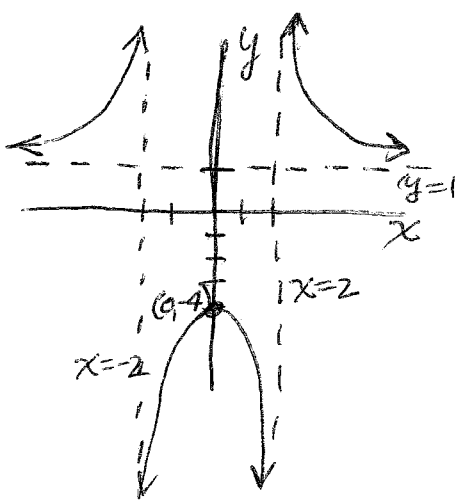
9. Given XY = 9Y - 6X

a) Domain:

b) Range:

c) Function?

10. Given:



a) Domain:

b) Range:

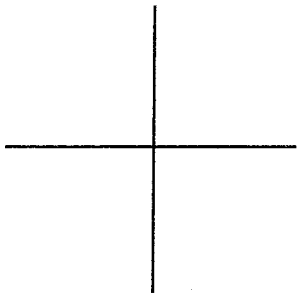
c) Function?

12. Find the equation of a circle whose center is (-2, 6) that passes through (4, 8).

13. Use a calculator to sketch and the graph and find domain and range of $x^2 - y^2 = 16$.

D: _____

R: _____



14. Let $f(X) = 2X - 5$ and $g(X) = X^2 + 4X - 6$

a) $(f + g)(2) =$

b) $(f - g)(2) =$

c) $(f \cdot g)(2) =$

d) $(f/g)(2) =$

e) $(f \circ g)(2) =$

f) $(g \circ f)(2) =$

15. Given $f(X) = \frac{4}{5X - 3}$, find $f^{-1}(X)$.

16. $f(x) = \begin{cases} -x^2 & \text{if } x > 2 \\ 4 & -2 \leq x \leq 2 \\ 4 - x & x < -2 \end{cases}$

a) $f(2) =$

b) $f(6) =$

c) $f(-6)$

d) $f(0) =$

e) $f(10)$

f) $f(-10) =$

College Algebra Exam 2 GG2 Solutions

1a) $(-4,3)$ $(2,-1)$

a) mid $= \left(\frac{-4+2}{2}, \frac{3+(-1)}{2}\right)$

$= (-1,1)$

b) $m = \frac{y_2-y_1}{x_2-x} = \frac{-1-3}{2-(-4)}$

$= -\frac{4}{6} = -\frac{2}{3}$

c) $d = \sqrt{6^2+4^2}$

$= \sqrt{36+16} = \sqrt{52}$

$= 2\sqrt{13}$ or 7.21

2. $m = -\frac{2}{3}$ $m_\perp = \frac{3}{2}$

$y = mx + b$

$1 = \frac{3}{2}(-1) + b$

$2 = -3 + 2b$

$5 = 2b$

$b = \frac{5}{2}$

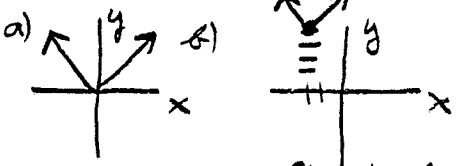
$y = \frac{3}{2}x + \frac{5}{2}$

3a) Use graph mode or "shifting"

a) y1= [custom] [abs] x

b) y1= [abs] [(x + 2)] +4

c) y1= [(-)] [abs] [(x - 3)]



Left 2, up 4

Right 3, Invert

4. $x = 2y^2 + 8y + 18$

Parabola, opens Right

$x\_\_\_ = 2(y^2+4y+\_\_\_) + 18$

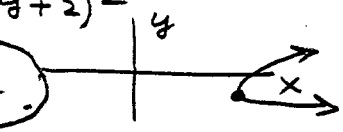
$x + 8 = 2(y^2+4y+4) + 18$

$-18 \qquad\qquad -18$

$x - 10 = 2(y+2)^2$

V $(10,-2)$

opens Right.



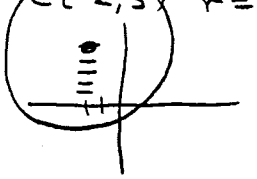
5. $x^2 + y^2 + 4x - 10y - 7 = 0$

Circle

$x^2+4x+\underline{4} + y^2-10y+\underline{25} = 7+\underline{4}+\underline{25}$

$(x+2)^2 + (y-5)^2 = 36$

C $(-2,5)$ $r = 6$



6. $f(x) = \frac{4x-2}{x+2}$

a) $f(2) = \frac{8-2}{2+2} = \frac{6}{4} = \frac{3}{2}$

b) $f(-2) = \frac{-8-2}{-2+2}$

undefined

c) $f(3x-7) = \frac{4(3x-7)-2}{3x-7+2} = \frac{12x-30}{3x-5}$

7. $f(x) = \frac{x^2-4}{4x}$ $g(x) = 5x+2$

a) $f[g(x)] = \frac{(5x+2)^2-4}{4(5x+2)}$

$= \frac{25x^2+20x+4-4}{4(5x+2)}$

$= \frac{5x(5x+4)}{4(5x+2)}$

b) $g[f(x)] = \frac{5}{1}\left(\frac{x^2-4}{4x}\right) + 2 \cdot \frac{4x}{4x}$

$= \frac{5x^2-20}{4x} + \frac{8x}{4x}$

$= \frac{5x^2+8x-20}{4x}$

8a) $y = \frac{x-2}{x^2-6x}$

D: $x^2-6x \neq 0$

$x(x-6) \neq 0$

D: all $x \neq 0, x \neq 6$

b) $y = \frac{x-3}{\sqrt{2+x}}$

D: $2+x > 0$

$x > -2$

$(-2, \infty)$

c) $y = \sqrt{6+9x}$

D: $6+9x \geq 0$

$9x \geq -6$

$x \geq -\frac{2}{3}$

$[-\frac{2}{3}, \infty)$

d) $y = x^2 - 16$

No Restrictions

D: $(-\infty, \infty)$

9. $xy = 9y - 6x$

a) D: Solve for y

$xy - 9y = -6x$

$y(x-9) = -6x$

$y = \frac{-6x}{x-9}$ D: all $x \neq 9$

b) R: Solve for x

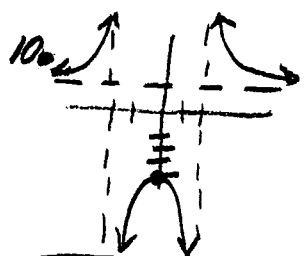
$xy + 6x = 9y$

$x(y+6) = 9y$

$x = \frac{9y}{y+6}$ R: all $y \neq -6$

c) F? Yes

10.



a) D: all $x \neq \pm 2$

b) R: $(-\infty, -4] \cup (1, \infty)$

c) Yes

11. C $(-2,6)$ thru $(4,8)$

$d = \sqrt{6^2+2^2}$

$= \sqrt{40}$

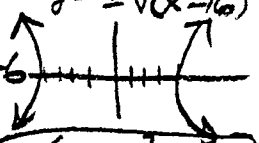
$(x+2)^2 + (y-6)^2 = 40$

13. $x^2 - y^2 = 16$

$-y^2 = 16 - x^2$

$y^2 = x^2 - 16$

$y = \pm\sqrt{(x^2-16)}$



D: $(-\infty, -4] \cup [4, \infty)$

R: $(-\infty, \infty)$

14. $f(x) = 2x - 5$ $g(x) = x^2 + 4x - 6$

$f(2) = -1$ $g(2) = 6$

a) $-1 + 6 = 5$

b) $-1 - 6 = -7$

c) $-1 \cdot 6 = -6$

d) $-1/6$

e) $f[g(2)] = f(6) = 12 - 5 = 7$

f) $g[f(2)] = g(-1) = 1 - 4 - 6 = -9$

15. $y = \frac{4}{5x-3}$

$f(x)$: $x = \frac{4}{5y-3}$

$f^{-1}(x)$: $5xy - 3x = 4$

$y = \frac{4+3x}{5x} = f^{-1}(x)$

16) a) 4 b) -36 c) 10 d) 4 e) -100 f) 14