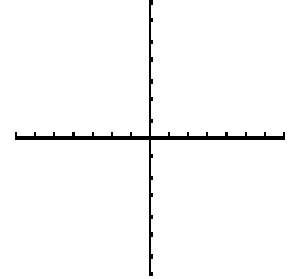


6. Find the center and radius by completing the square. Sketch.

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



7. Let $f(x) = \frac{3-4x}{x-3}$

a) $f(-3) =$

b) $f(3) =$

c) $f(4x-7) =$

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

a) find $f[g(x)]$ and simplify.

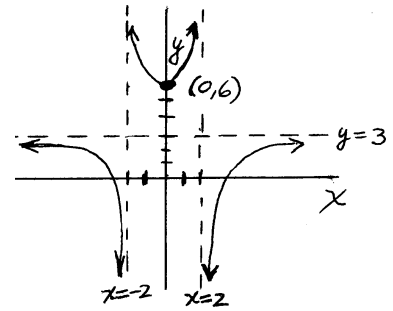
b) find $g[f(x)]$ and simplify.

9. Find the domain (give interval notation when appropriate). Use graphing calculator for c).

a) $y = x^2 - 25$ b) $y = \frac{x-4}{x^2-25}$ c) $y = \sqrt{25-x^2}$ d) $y = \frac{x-6}{\sqrt{5-x}}$

10. Given the equation $xy = 4y + 4$

11. Given the graph:



a) Domain:

a) Domain:

b) Range:

b) Range:

c) Function?

c) Function?

12. Let $f(x) = 2x + 3$ and $g(x) = x^2 - 4x - 6$

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

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

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

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

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

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

13. Given $f(x) = \frac{3x-5}{x}$, find $f^{-1}(x)$.

COLLEGE ALGEBRA EXAM 2 DG Solutions

1. $(-3, 5)$ $(-1, -3)$

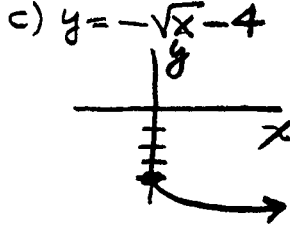
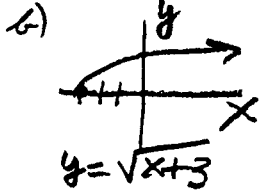
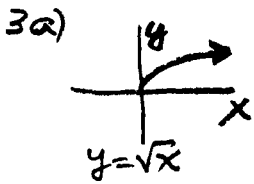
a) midpt = $(\frac{-3-1}{2}, \frac{5-3}{2})$
 $(\frac{-4}{2}, \frac{2}{2})$
 $(-2, 1)$

b) $m = \frac{-3-5}{-1+3}$
 $= \frac{-8}{2}$
 $= -4$

c) $d = \sqrt{2^2 + 8^2}$
 $= \sqrt{68}$
 $= 2\sqrt{17}$
 ≈ 8.25

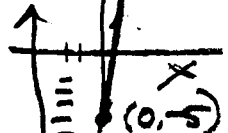
2. $m_{\perp} = \frac{1}{4}$ $(-2, 1)$

$y = mx + b$
 $1 = \frac{1}{4}(-2) + b$
 $4 = -2 + 4b$
 $6 = 4b$
 $b = \frac{3}{2}$
 $y = \frac{1}{4}x + \frac{3}{2}$



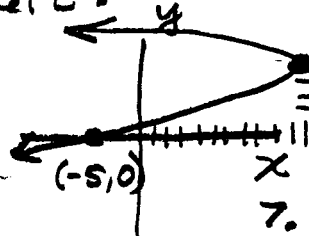
4. $y = 2x^2 + 8x - 5$ opens up.

$y + 8 = 2(x^2 + 4x + 4) - 5$
 $+5$
 $y + 13 = 2(x+2)^2 - 5$
 $+5$
 $y + 18 = 2(x+2)^2$
 $V(-2, -13)$



5. $x = -y^2 + 8y - 5$ opens left.

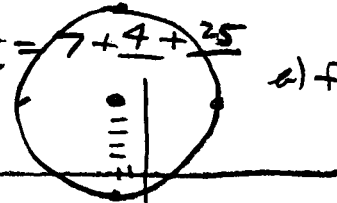
$x = -(y^2 - 8y) - 5$
 $x - 16 = -(y^2 - 8y + 16) - 5$
 $+5$
 $x - 11 = -(y - 4)^2$
 $V(11, 4)$



CALCULATOR:
 GRAPH, $y1 = 2x^2 + 8x - 5$,
 EXIT, MORE, MATH, MORE, FMIN
 ENTER: $x = -1.99999806, y = -13$.

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

$x^2 + 4x + 4 + y^2 - 10y + 25 = 7 + 4 + 25$
 $(x+2)^2 + (y-5)^2 = 36$
 $C(-2, 5) \quad r = 6$



7. $f(x) = \frac{3-4x}{x-3}$

a) $f(-3) = \frac{3+12}{-6}$
 $= \frac{-9}{2}$

c) $f(4x-7)$
 $= \frac{3-4(4x-7)}{4x-7-3}$
 $= \frac{3-16x+28}{4x-10}$
 $= \frac{31-16x}{2(2x-5)}$

a) $f(3) = \frac{3-12}{0}$
 $= \text{undef.}$

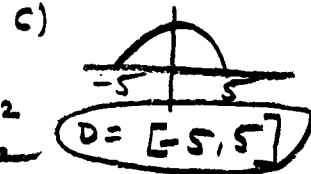
8. $f(x) = \frac{5x+4}{2x}$ $g(x) = x^2 - 4$

a) $f[g(x)] = \frac{5(x^2-4)+4}{2(x^2-4)}$
 $= \frac{5x^2-16}{2(x^2-4)}$

b) $g[f(x)] = (\frac{5x+4}{2x})^2 - 4$
 $= \frac{25x^2+40x+16}{4x^2} - \frac{4 \cdot 4x^2}{4x^2}$
 $= \frac{9x^2+40x+16}{4x^2}$

9a) All Reals $(-\infty, \infty)$

b) $x^2 - 25 \neq 0$
 $\text{all } x \neq \pm 5$



d) $5 - x > 0$
 $-x > -5$
 $x < 5$
 $(-\infty, 5)$

10. $xy = 4y + 4$ $x = \frac{4y+4}{y}$

$xy - 4y = 4$
 $y(x-4) = 4$
 $y = \frac{4}{x-4}$
 a) $D = \text{all } x \neq 4$
 AR: $\text{all } y \neq 0$

11a) $D: \text{all } x \neq \pm 2$

b) $R: (-\infty, 3) \cup [6, \infty)$

c) $F? \text{ Yes}$

12. $f(x) = 2x+3$ $g(x) = x^2 - 4x - 6$
 $f(2) = 7$ $g(2) = 4 - 8 - 6 = -10$

a) $(f+g)(2) = 7 + (-10) = -3$

b) $(f-g)(2) = 7 - (-10) = 17$

c) $(fg)(2) = 7 \cdot (-10) = -70$

12a) $f[g(2)] = f(-10) = -17$

12b) $g[f(2)] = g(7) = 49 - 28 - 6 = 15$

13. $y = \frac{3x-5}{x}$
 $x = \frac{3y-5}{y}$
 $xy = 3y - 5$
 $xy - 3y = -5$
 $y(x-3) = -5$
 $y = \frac{-5}{x-3}$
 $\text{or } f(x) = \frac{5}{3-x}$