P.1 Homework p. 8-9 #19-25 odd, 61-67 odd

Find any intercepts: * x-ints: set $y=0$, solve for x in numerator
* y-ints: set $x=0$, solve for y

19) $y = x^2 + x - 2$

$0 = x^2 + x - 2$

$0 = (x+2)(x-1)$

$x = 1, -2$

x-ints: $(1,0), (-2,0)$

$y = 0^2 + 0 - 2$

$y = -2$

y-int: $(0,-2)$

21) $y = x^2\sqrt{25-x^2}$

$0 = x^2\sqrt{(5-x)(5+x)}$

$x = 0, 5, -5$

x-ints: $(0,0), (5,0), (-5,0)$

$y = 0\sqrt{25-0^2}$

$y = 0$

y-int: $(0,0)$

23) $y = \dfrac{3(2-\sqrt{x})}{x}$

$0 = 3(2-\sqrt{x})$

$2 - \sqrt{x} = 0$

$\sqrt{x} = 2$

$x = 4$

x-int: $(4,0)$

$y = \dfrac{3(2-\sqrt{0})}{0}$ = undefined

no y-intercept

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

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

$0 - x^2 + 0 = 0$

$x = 0$

x-int: $(0,0)$

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

$0 + 4y = 0$ $\quad y = 0$

y-int: $(0,0)$

P.1 continued

Find points of intersection: *Solve systems of equations using either substitution method or elimination method

61) $x+y=2$, $2x-y=1$

$y=x+2$

$2x-(x+2)=1$

$3x-2=1$

$3x=3$

$x=1$

$1+y=2$

$y=1$

$\boxed{(1,1)}$

63) $x^2+y=6$, $x+y=4$

$x^2+y=6$, $-x-y=-4$

$x^2-x+0=2$

$x^2-x-2=0$

$(x-2)(x+1)=0$

$x=2,-1$

$-1+y=4$ | $2+y=4$

$y=5$ | $y=2$

$\boxed{(2,2),(-1,5)}$

65) $x^2+y^2=5$, $x-y=1$

$x=y+1$

$(y+1)^2+y^2=5$

$y^2+2y+1+y^2=5$

$2y^2+2y-4=0$

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

$2(y+2)(y-1)=0$

$y=1,-2$

$x=1+1=2$

$x=-2+1=-1$

$\boxed{(2,1),(-1,-2)}$

67) $y=x^3$, $y=x$

$x=x^3$

$x^3-x=0$

$x(x^2-1)=0$

$x(x+1)(x-1)=0$

$x=0,-1,1$

$y=x$

$y=0$

$y=-1$

$y=1$

$\boxed{(0,0),(-1,-1),(1,1)}$

P.2 p. 16-17 #27, 35, 59-63 odds

27) Find equation of line passing through point with indicated slope.

point: $(0,3)$ $m = \frac{3}{4}$

$y - y_1 = m(x - x_1)$

$\boxed{y - 3 = \frac{3}{4}(x - 0) \quad \text{or} \quad y = \frac{3}{4}x + 3}$

35) Find equation of line passing through the points $(2,1), (0,-3)$

* Find slope, then write equation of line in point-slope form.

$m = \frac{y_2 - y_1}{x_2 - x_1}$ $m = \frac{1 - -3}{2 - 0} = \frac{4}{2} = 2$

$y - y_1 = m(x - x_1)$ $\boxed{y - 1 = 2(x - 2)}$

59) Write equation of line through point a) parallel to given line b) perpendicular to given line

point $(2,1)$ line: $4x - 2y = 3$

* Find slope $2y = 4x - 3$ $y = \frac{4}{2}x - \frac{3}{2}$ $\underline{\underline{m = 2}}$

a) $y - 1 = 2(x - 2)$

b) * perpendicular slope is opposite reciprocal Since $m_1 = 2$, $m_2 = \frac{-1}{2}$

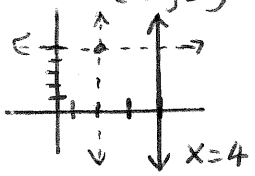
$y - 1 = \frac{-1}{2}(x - 2)$

61) point: $(\frac{3}{4}, \frac{7}{8})$ line: $5x - 3y = 0 \rightarrow 3y = 5x$ $y = \frac{5}{3}x$ $\underline{\underline{m = \frac{5}{3}}}$

a) $y - \frac{7}{8} = \frac{5}{3}(x - \frac{3}{4})$

b) $m_2 = \frac{-3}{5}$ $y - \frac{7}{8} = \frac{-3}{5}(x - \frac{3}{4})$

63) point: $(2,5)$ line: $x = 4$



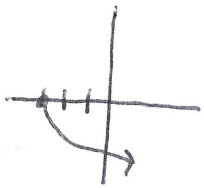
a) $x = 2$

b) $y = 5$

P.3 p.27-28 # 5, 9, 11, 13, 19, 20, 23, 25, 53, 54, 59, 61, 67-71 a

Find Domain/Range

13) $h(x) = -\sqrt{x+3}$



D: $[-3, \infty)$
R: $(-\infty, 0]$

19) $f(x) = \sqrt{x} + \sqrt{1-x}$

$[0,\infty)$ $(-\infty, 1]$

D: $[0, 1]$

20) $f(x) = \frac{\sqrt{x^2-3x+2}}{\sqrt{(x-2)(x-1)}}$ $x = 1, 2$

D: $(-\infty, 1] \cup [2, \infty)$

23) $f(x) = \frac{1}{|x+3|}$ $x \neq -3$ D: $(-\infty, -3) \cup (-3, \infty)$

54) a) $f(x-4)$ → graph shifts 4 units right
b) $f(x+2)$ → graph shifts 2 units left
c) $f(x)+4$ → 4 units up
d) $f(x)-1$ → 1 unit down
e) $2f(x)$ → multiply y-value by 2 (stretch by factor of 2)
f) $\frac{1}{2}f(x)$ → multiply y-value by ½ (compress by factor of ½)

59) $f(x) = x^2$ $g(x) = \sqrt{x}$

$f(g(x)) = f(\sqrt{x}) = (\sqrt{x})^2 = x$, D: $[0, \infty)$

$g(f(x)) = g(x^2) = \sqrt{x^2} = x$ D: $(-\infty, \infty)$

61) $f(x) = \frac{3}{x}$ $g(x) = x^2 - 1$

$f(g(x)) = f(x^2-1) = \frac{3}{x^2-1}$

D: $(-\infty, -1) \cup (-1, 1) \cup (1, \infty)$

$g(f(x)) = g(\frac{3}{x}) = (\frac{3}{x})^2 - 1$ $x \neq 0$

D: $(-\infty, 0) \cup (0, \infty)$

P.31

Determine if function is even, odd, or neither

67) $f(x) = x^2(4-x^2)$ → even $f(-x) = f(x)$

68) $f(x) = \sqrt[3]{x}$ → odd $f(-x) = -f(x)$

69) $f(x) = x\cos x$ → odd $f(-x) = -f(x)$

70) $f(x) = \sin^2 x$ → even $f(-x) = f(x)$

71) $(-\frac{3}{2}, 4)$ a) even → $(\frac{3}{2}, 4)$ b) odd → $(\frac{3}{2}, -4)$