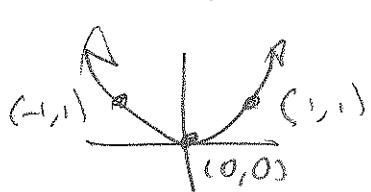


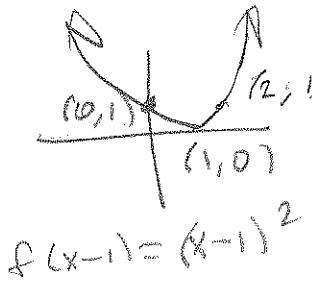
121 S_{2,3} R #s 45-78, 93-99

#s 45-60 Use transformations to graph each &
start to D & R

(45) $y = (x-1)^2 + 2$

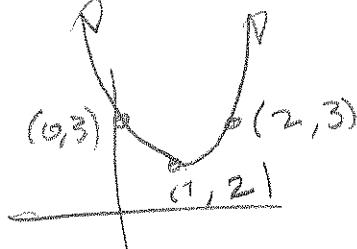


$$f(x) = x^2$$



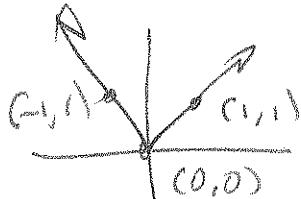
$$f(x-1) = (x-1)^2$$

D = R, R = [-1, \infty)

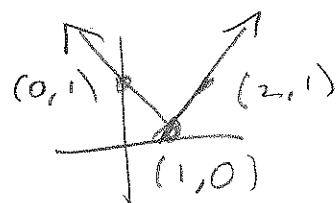


$$f(x-1) + 2 = (x-1)^2 + 2 =$$

(47) $y = |x-1| + 3$



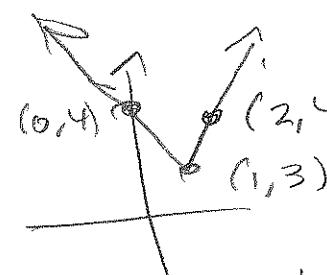
$$f(x) = |x|$$



$$f(x-1) = |x-1|$$

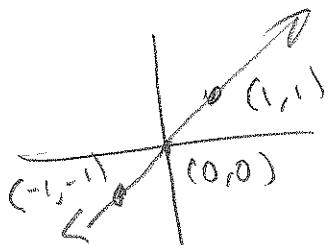
D = R

R = [3, \infty)

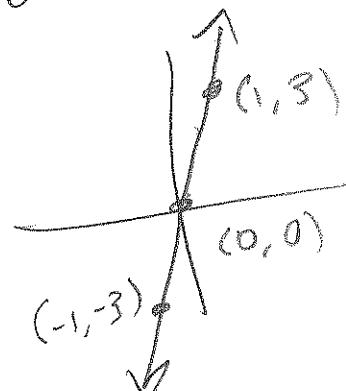


$$f(x-1) + 3 = |x-1| + 3$$

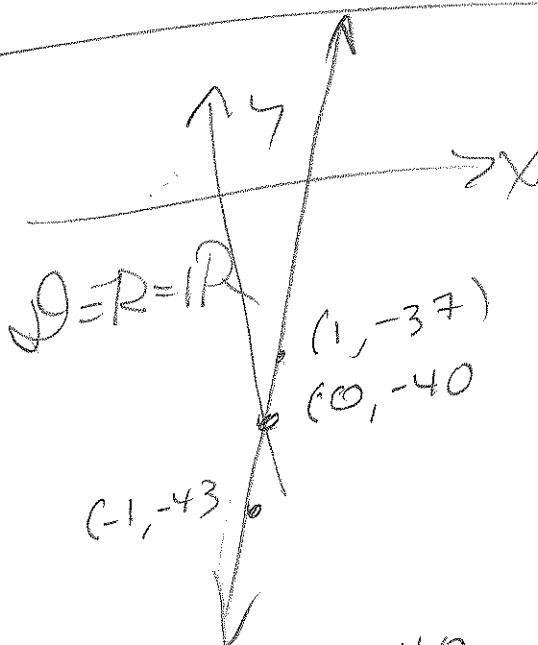
(49) $y = 3x - 40$



$$f(x) = x$$



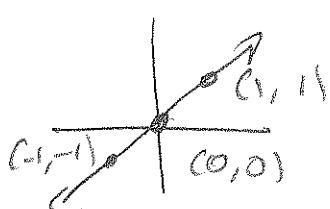
$$3f(x) = 3x$$



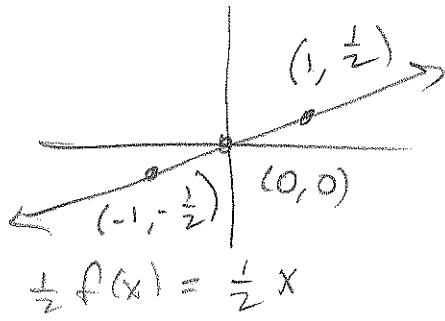
$$3f(x) - 40 = 3x - 40$$

121 S'2.3 IT #5 51-75, 93-99

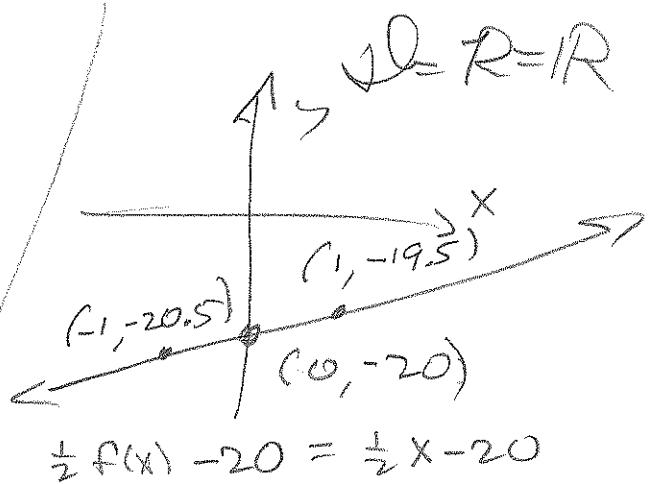
(51) $y = \frac{1}{2}x - 20$



$$f(x) = x$$

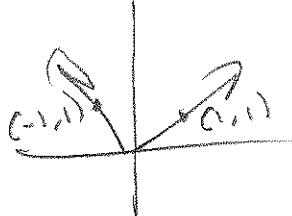


$$\frac{1}{2}f(x) = \frac{1}{2}x$$

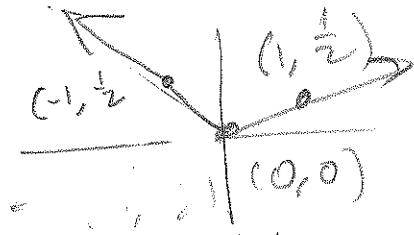


$$\frac{1}{2}f(x) - 20 = \frac{1}{2}x - 20$$

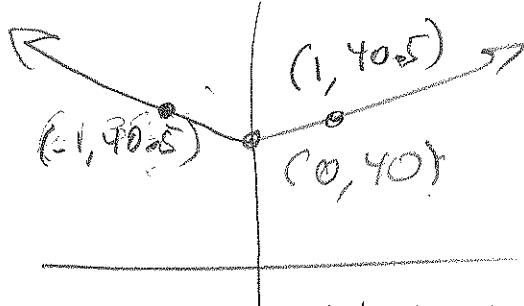
(53) $y = \frac{1}{2}|x| + 40$



$$f(x) = |x|$$



$$\frac{1}{2}f(x) = \frac{1}{2}|x|$$



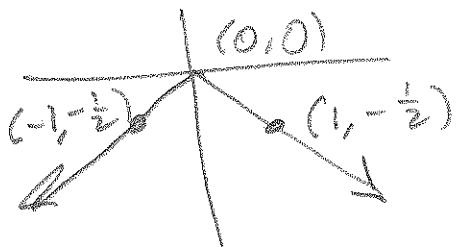
$$\frac{1}{2}f(x) + 40 = \frac{1}{2}|x| + 40$$

$$D = \mathbb{R}, R = [40, \infty)$$

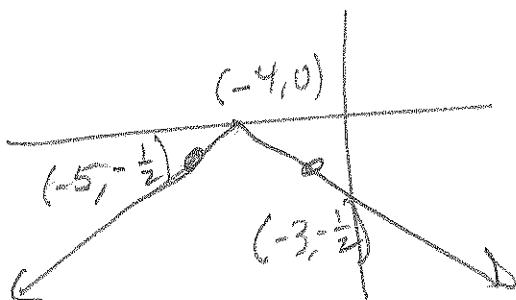
(55) $y = -\frac{1}{2}|x+4|$

See $|x|$, above

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



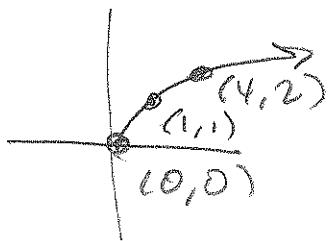
$$-\frac{1}{2}f(x+4) = -\frac{1}{2}|x+4|$$



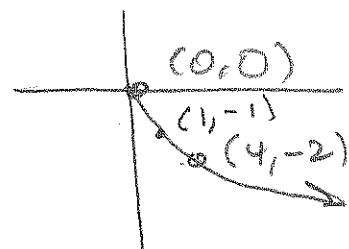
$$D = \mathbb{R}, R = (-\infty, 0]$$

121 S' 2,3 IT #557-75, 93-99

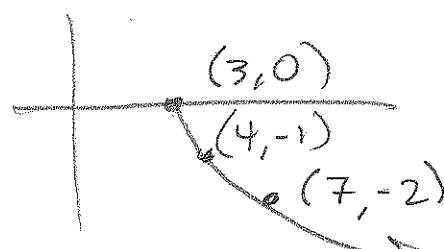
57 $y = -\sqrt{x-3} + 1$



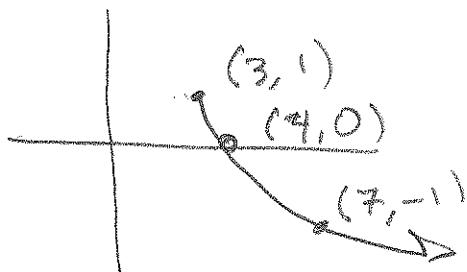
$$f(x) = \sqrt{x}$$



$$-f(x) = -\sqrt{x}$$



$$-f(x-3) = -\sqrt{x-3}$$



$$-f(x-3) + 1 = -\sqrt{x-3} + 1$$

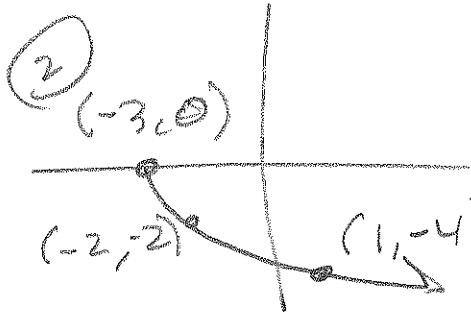
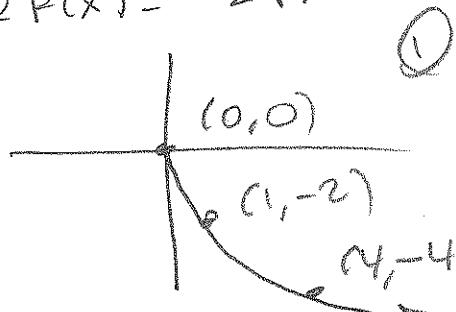
$$D = [3, \infty), R = (-\infty, 1]$$

59 $y = -2\sqrt{x+3} + 2$

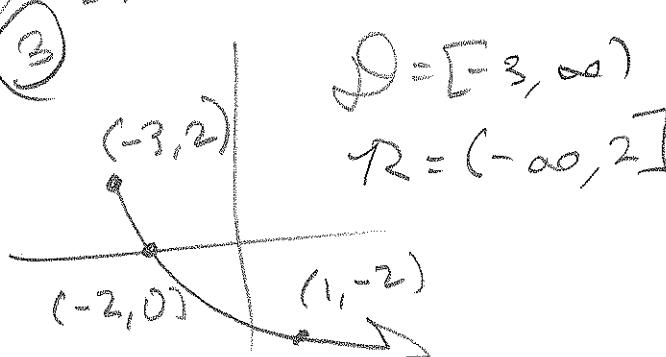
$$-2f(x+3) = -2\sqrt{x+3}$$

See $f(x) = \sqrt{x}$, above

$$-2f(x) = -2\sqrt{x}$$



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



$$D = [-3, \infty)$$

$$R = (-\infty, 2]$$

121 S^t 2.3 II #s 61-75, 93-99

#s 61-80 Determine algebraically if function is even, odd or neither. Describe symmetry.

(61) $f(x) = x^4 \Rightarrow f(-x) = (-x)^4 = x^4 = f(x)$

EVEN Symmetric about $y = ax + b$

(63) $f(x) = x^4 - x^3 \Rightarrow f(-x) = (-x)^4 - (-x)^3$
 $= x^4 + x^3$ [Neither]
No symmetry

(65) $f(x) = (x+3)^2 \Rightarrow f(-x) = (-x+3)^2$ or $(x-3)^2$
Symmetric about $x = -3$ [Neither]

(67) $f(x) = |x-2| \Rightarrow f(-x) = |-x-2|$ or $|x+2|$
Symmetric about $x = 2$ [Neither]

(69) $f(x) = x \Rightarrow f(-x) = -x$ [ODD]
Symmetric thru origin

(71) $f(x) = 3x+2 \Rightarrow f(-x) = -3x+2$ [Neither]
No symmetry

121 S' 2.3 RE 73-75, 93-99

73 $f(x) = x^3 - 5x + 1 \Rightarrow f(-x) = -x^3 + 5x + 1$
ODD+EVBN No symmetry Neither.

75 $f(x) = 1 + \frac{1}{x^2} \Rightarrow f(-x) = 1 + \frac{1}{(-x)^2} = 1 + \frac{1}{x^2}$
EVEN Symmetric about $y = ax + b$.

#s 93-100 Solve each inequality by graph. Give sol'n in interval notation.

93 $(x-1)^2 - 9 < 0$

$$(x-1)^2 = 9$$
$$x-1 = \pm 3$$
$$x = 1 \pm 3$$

$\begin{array}{c} \text{Graph of } (x-1)^2 - 9 < 0 \\ \text{The parabola } y = (x-1)^2 - 9 \text{ opens upwards. It passes through } (-2, 0) \text{ and } (4, 0). \\ \text{The region below the parabola is shaded. Points marked: } (-2, 0), (4, 0), (1, -9). \end{array}$

$\begin{array}{c} \text{Solve } (x-1)^2 - 9 < 0 \\ (x-1)^2 = 9 \\ x-1 = \pm 3 \\ x = 1 \pm 3 \\ \text{The solution is } x \in (-2, 4). \end{array}$

95 $5 - \sqrt{x} \geq 0$

$$\sqrt{x} = 5$$
$$x = 25$$
$$-\sqrt{x} + 5 \geq 0$$

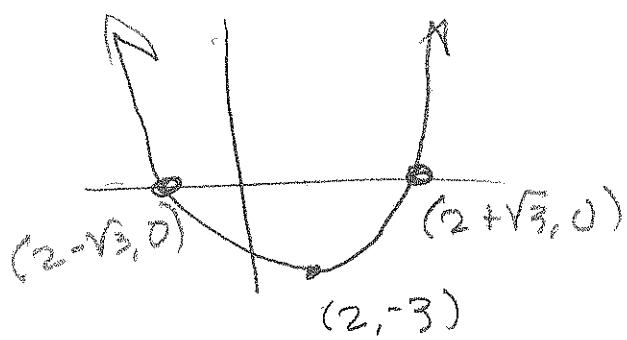
$\begin{array}{c} \text{Graph of } 5 - \sqrt{x} \geq 0 \\ \text{The function } y = 5 - \sqrt{x} \text{ is decreasing. It passes through } (0, 5) \text{ and } (25, 0). \\ \text{The region above the curve is shaded. Points marked: } (0, 5), (25, 0). \end{array}$

$\begin{array}{c} \text{Solve } 5 - \sqrt{x} \geq 0 \\ \sqrt{x} = 5 \\ x = 25 \\ \text{The solution is } x \in [0, 25]. \end{array}$

121 S'2,3 II #s 97, 99

(97) $(x-2)^2 > 3$

$$(x-2)^2 - 3 > 0$$



$$(x-2)^2 = 3$$

$$x-2 = \pm\sqrt{3}$$

$$x = 2 \pm \sqrt{3}$$

Want > 0 , so, by graph:

$$\boxed{x \in (-\infty, 2-\sqrt{3}) \cup (2+\sqrt{3}, \infty)}$$

(99) $\sqrt{25-x^2} > 0$

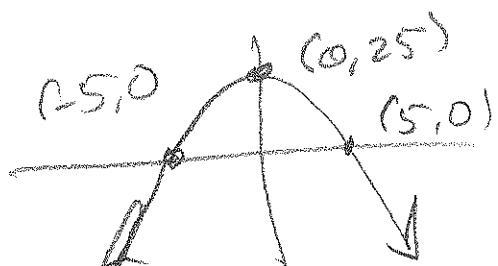
$\sqrt{\text{anything}} \geq 0$

Need domain:

Need $25-x^2 \geq 0$

$$(5-x)(5+x) \geq 0$$

$$= -(x-5)(x+5)$$



$$-x^2 + 25$$