#47 (2.5)

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

$$y = -\frac{1}{x}$$

$$x = -\frac{1}{y}$$

$$-\frac{x}{1} = \frac{1}{y}$$

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

#55 (2.5) $f(x) = x^2+1$ $g(x) = \sqrt{x-1}$

$f[g(x)] = f[\sqrt{x-1}] = x-1+1 = x$

$g[f(x)] = g[x^2+1] = \sqrt{x^2+1-1} = \sqrt{x^2} = x$

$\therefore$ f, g are inverses of eachother

#51 (2.5)

$f(x) = (x-2)^2$, $\underline{x \geq 2}$

$y = (x-2)^2$

$\underline{x = (y-2)^2}$

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

$2 \pm \sqrt{x} = y = f^{-1}(x)$, $y \geq 2$, $x \geq 0$

$f^{-1}(x) = 2+\sqrt{x}$

#25 (2.6)

$$\frac{m}{t^2} = k \qquad \frac{54}{(3\sqrt{2})^2} = k = \frac{54}{18} = 3$$

$$\frac{m}{t^2} = 3 \qquad m = 3t^2$$

53 (2.6)

$$\frac{S}{Pt} = k \qquad \frac{20.80}{(4000)16} = k$$

$$\frac{S}{6500 \cdot 24} = k$$

#29 (2.6)

$$\frac{y}{x} = k \qquad \frac{9}{2} = k \qquad \frac{y}{-3} = \frac{9}{2}$$

$$2y = -27$$

$$y = -\frac{27}{2}$$

#33 (2.6)

$$\frac{A}{LW} = k \qquad \frac{\cancel{30}\,2}{\cancel{3}\cdot\cancel{5}\sqrt{2}} = k = \frac{2}{\sqrt{2}}\cdot\frac{\sqrt{2}}{\sqrt{2}} = \frac{2\sqrt{2}}{2}$$

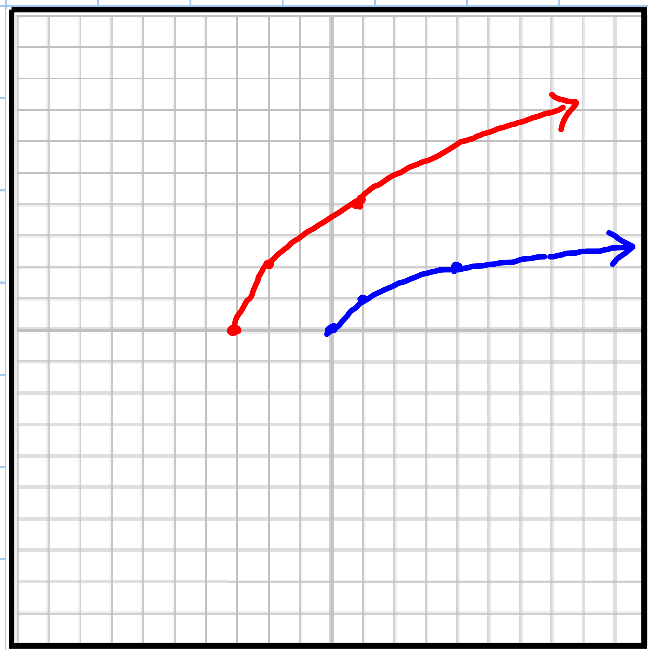
$$k = \sqrt{2} \qquad \frac{A}{2\sqrt{3}\cdot\frac{1}{2}} = \sqrt{2} \Rightarrow \frac{A}{\sqrt{3}} = \sqrt{2}$$

$$A = \sqrt{6}$$

#41 (chapter review)

Blue curve is the standard "famous function" the square root function.

The red curve is the answer, as it is moved left 3 units, and each y coordinate is twice the corresponding y coordinate of the blue curve.



#55 (Ch. Rev.)

$f(x) = -5x+9$

$f(x+h) = -5(x+h)+9$

$= -5x-5h+9$

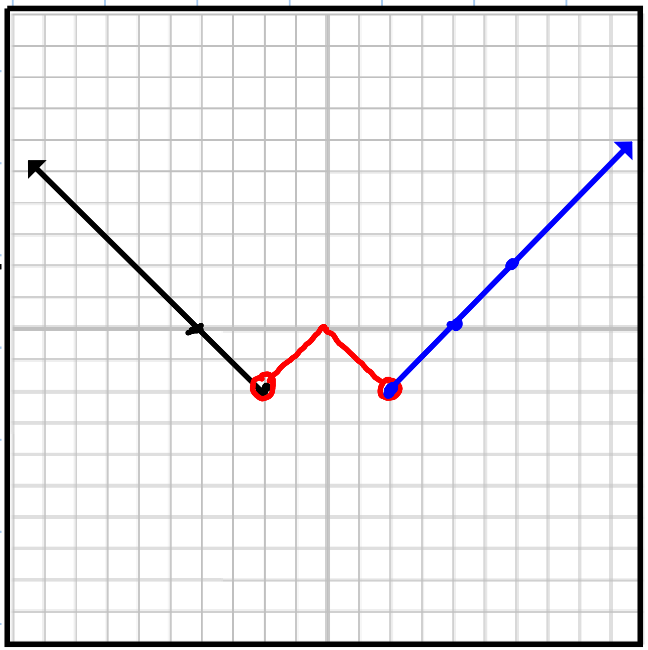
$$\frac{f(x+h)-f(x)}{h}$$

$$\frac{-5x-5h+9-(-5x+9)}{h}$$

$$= \frac{-5h}{h} = -5$$

#63. **(chapter review)**

$$f(x) = \begin{cases} -x-4, & x \le -2 \\ -|x|, & -2 < x < 2 \\ x-4, & x \ge 2 \end{cases}$$



a made-up example of a difference quotient problem:

$$f(x) = 2x^3 - 3x^2 + x - 1$$

find the difference quotient

$$f(x+h) = 2(x+h)^3 - 3(x+h)^2 + (x+h) - 1$$

$$= \frac{\cancel{2x^3} + 6x^2h + 6xh^2 + 2h^3 - \cancel{3x^2} - 6xh - 3h^2 + \cancel{x} + h \cancel{-1}}{h}$$

$$= \frac{\cancel{h}(6x^2 + 6xh + 2h^2 - 6x - 3h + 1)}{\cancel{h}}$$

$$= 6x^2 + 6xh + 2h^2 - 6x - 3h + 1$$

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this work is the response to a request for more work on how to find domain and range:

$$f(x) = \frac{2}{x-2} \qquad D: (-\infty, 2) \cup (2, \infty)$$

$$g(x) = \sqrt{x+9} \qquad D: [-9, \infty)$$

#35 (Ch. Rev.) find: $\boxed{\dfrac{f(x+h)-f(x)}{h}}$

$$f(x) = x^2+3$$

$$f(x+h) = (x+h)^2+3$$

$$x^2+2xh+h^2+3$$

$$\frac{x^2+2xh+h^2+3-(x^2+3)}{h} = \frac{2xh+h^2}{h}$$

$$= \frac{\cancel{h}(2x+h)}{\cancel{h}} = 2x+h$$

a request was made for some sample work on functions that were defined with ordered pairs. Here are a few samples:

$$f(x) = \{(1,2); (2,6); (3,-1)\}$$
$$g(x) = \{(2,-9); (6,1); (7,2)\}$$

$$f[g(x)] = \{(6,2), (7,6)\}$$

$$g[f(x)] = \{(1,-9), (2,1)\}$$

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