1.1

(8) $\neq$, $f(x), g(x)$

(15) The relation is a fxn.

D: {Elvis, Colleen, Kaleigh, Marissa}

R: {Jan 8, Mar 15, Sept 17}

(25) The relation is a fxn.

D: $\{-1, 1, 0, -2\}$

R: $\{0, 1, 4\}$

(37) $2x^2 + 3y^2 = 1$

$-2x^2 \qquad -2x^2$

$\frac{3y^2}{3} = \frac{1-2x^2}{3}$

$y^2 = \frac{1-2x^2}{3}$

$y = \pm\sqrt{\frac{1-2x^2}{3}}$ not a fxn

(39) $f(x) = 3x^2 + 2x - 4$

a) $f(0) = 3(0)^2 + 2(0) - 4 = \boxed{-4}$

b) $f(1) = 3(1)^2 + 2(1) - 4 = 3 + 2 - 4 = \boxed{1}$

c) $f(-1) = 3(-1)^2 + 2(-1) - 4 = 3 - 2 - 4 = \boxed{-3}$

d) $f(-x) = 3(-x)^2 + 2(-x) - 4 = \boxed{3x^2 - 2x - 4}$

e) $-f(x) = -(3x^2 + 2x - 4) = \boxed{-3x^2 - 2x + 4}$

f) $f(x+1) = 3(x+1)^2 + 2(x+1) - 4 = 3(x^2 + 2x + 1) + 2x + 2 - 4$

$= 3x^2 + 6x + 3 + 2x + 2 - 4$

$= \boxed{3x^2 + 8x + 1}$

g) $f(2x) = 3(2x)^2 + 2(2x) - 4$

$= 3(4x^2) + 4x - 4$

$= \boxed{12x^2 + 4x - 4}$

h) $f(x+h) = 3(x+h)^2 + 2(x+h) - 4$

$= 3(x^2 + 2hx + h^2) + 2x + 2h - 4$

$= \boxed{3x^2 + 6hx + 3h^2 + 2x + 2h - 4}$

(48) Domain of $f(x) = x^2 + 2$ is $(-\infty, \infty)$

(52) Domain of $h(x) = \frac{2x}{x^2 - 4}$

$x^2 - 4 \neq 0$

$+4 \quad +4$

$x^2 \neq 4$

$x \neq \pm 2$

D: $\{x \mid x \neq \pm 2\}$

OR

$(-\infty, -2), (-2, 2), (2, \infty)$

(69) $f(x) = 2x + 1$; $g(x) = 3x - 2$

a) $(f+g)(x) = f(x) + g(x) = (2x+1) + (3x-2)$

$= 5x - 1$

e) $(f+g)(3) = 5(3) - 1 = 15 - 1 = 14$

b) $(f-g)(x) = f(x) - g(x) = (2x+1) - (3x-2)$

$= 2x + 1 - 3x + 2$

$= -x + 3$

f) $(f-g)(4) = -(4) + 3 = -1$

c) $(f \cdot g)(x) = f(x) \cdot g(x) = (2x+1)(3x-2)$

$= 6x^2 - 4x + 3x - 2$

$= 6x^2 - x - 2$

g) $(f \cdot g)(2) = 6(2)^2 - (2) - 2$

$= 6(4) - 2 - 2 = 24 - 4 = 20$

d) $\left(\frac{f}{g}\right)(x) = \frac{f(x)}{g(x)} = \frac{2x+1}{3x-2}$

h) $\left(\frac{f}{g}\right)(1) = \frac{2(1)+1}{3(1)-2} = \frac{2+1}{3-2} = \frac{3}{1} = 3$

77) $f(x) = x^2 - x + 4$

$f(x+h) = (x+h)^2 - (x+h) + 4$

$= x^2 + 2hx + h^2 - x - h + 4$

$$\frac{f(x+h) - f(x)}{h} = \frac{(x^2 + 2hx + h^2 - x - h + 4) - (x^2 - x + 4)}{h}$$

$$= \frac{x^2 + 2hx + h^2 - x - h + 4 - x^2 + x - 4}{h}$$

$$= \frac{2hx + h^2 - h}{h}$$

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

$$= \boxed{2x + h - 1}$$