p389 1, 2, 8-16, 64-66

Key

① $f(x) = x+2$

$g(x) = 3x-1$

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

$= \boxed{4x+1}$

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

$= \boxed{-2x+3}$

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

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

$= \boxed{3x^2+5x-2}$

$\left(\frac{f}{g}\right)(x) = \boxed{\frac{x+2}{3x-1}, \; x \neq \frac{1}{3}}$

$3x-1=0$

$x=\frac{1}{3}$

② $f(x) = x^2-5$

$g(x) = -x+8$

$(f+g)(x) = x^2-5+(-x+8)$

$= \boxed{x^2-x+3}$

$(f-g)(x) = (x^2-5)-(-x+8)$

$= \boxed{x^2+x-13}$

$(f \cdot g)(x) = (x^2-5)(-x+8)$

$= \boxed{-x^3+8x^2+5x-40}$

$\left(\frac{f}{g}\right)(x) = \boxed{\frac{x^2-5}{-x+8}, \; x \neq 8}$

$-x+8=0$

$x=8$

⑧ $f(x) = 2x$

$g(x) = -4x+5$

$(f+g)(x) = 2x+(-4x+5)$

$= \boxed{-2x+5}$

$(f-g)(x) = (2x)-(-4x+5)$

$= \boxed{6x-5}$

$(f \cdot g)(x) = (2x)(-4x+5)$

$= \boxed{-8x^2+10x}$

$\left(\frac{f}{g}\right)(x) = \boxed{\frac{2x}{-4x+5}, \; x \neq \frac{5}{4}}$

⑨ $f(x)=x-1$

$g(x)=5x-2$

$(f+g)(x)=x-1+5x-2$

$=\boxed{6x-3}$

$(f-g)(x)=(x-1)-(5x-2)$

$=\boxed{-4x+1}$

$(f\cdot g)(x)=(x-1)(5x-2)$

$=5x^2-2x-5x+2$

$=\boxed{5x^2-7x+2}$

$(\frac{f}{g})(x)=\boxed{\frac{x-1}{5x-2},\ x\neq\frac{2}{5}}$

⑩ $f(x)=x^2$

$g(x)=-x+1$

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

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

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

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

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

$=\boxed{-x^3+x^2}$

$(\frac{f}{g})(x)=\boxed{\frac{x^2}{-x+1},\ x\neq 1}$

⑪ $f(x)=3x$

$g(x)=-2x+6$

$(f+g)(x)=3x+(-2x+6)$

$=\boxed{x+6}$

$(f-g)(x)=(3x)-(-2x+6)$

$=\boxed{5x-6}$

$(f\cdot g)(x)=3x(-2x+6)$

$=\boxed{-6x^2+18x}$

$(\frac{f}{g})(x)=\boxed{\frac{3x}{-2x+6},\ x\neq 3}$

(12) $f(x) = x - 2$

$g(x) = 2x - 7$

$(f+g)(x) = x - 2 + 2x - 7$

$= \boxed{3x - 9}$

$(f \cdot g)(x) = (x-2)(2x-7)$

$= 2x^2 - 7x - 4x + 14$

$= \boxed{2x^2 - 11x + 14}$

$(f-g)(x) = (x-2) - (2x-7)$

$= \boxed{-x + 5}$

$\left(\frac{f}{g}\right)(x) = \boxed{\frac{x-2}{2x-7},\ x \neq \frac{7}{2}}$

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

$g(x) = x - 5$

$(f+g)(x) = \boxed{x^2 + x - 5}$

$(f \cdot g)(x) = x^2(x-5)$

$= \boxed{x^2 - 5x}$

$(f-g)(x) = (x^2) - (x-5)$

$= \boxed{x^2 - x + 5}$

$\left(\frac{f}{g}\right)(x) = \boxed{\frac{x^2}{x-5},\ x \neq 5}$

(14) $f(x) = -x^2 + 6$

$g(x) = 2x^2 + 3x - 5$

$(f+g)(x) = -x^2 + 6 + 2x^2 + 3x - 5$

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

$(f \cdot g)(x) = (-x^2+6)(2x^2+3x-5)$

$= -2x^4 - 3x^3 + 5x^2 + 12x^2 + 18x - 30$

$= \boxed{-2x^4 - 3x^3 + 17x^2 + 18x - 30}$

$(f-g)(x) = (-x^2+6) - (2x^2+3x-5)$

$= \boxed{-3x^2 - 3x + 11}$

$\left(\frac{f}{g}\right)(x) = \boxed{\frac{-x^2+6}{2x^2+3x-5},\ x \neq \frac{-5}{2}, 1}$

$2x^2 + 5x - 2x - 5$

$x(2x+5) - 1(2x+5)$

$(2x+5)(x-1)$

(15) $f(x) = 3x^2 - 4$

$g(x) = x^2 - 8x + 4$

$(f+g)(x) = 3x^2 - 4 + x^2 - 8x + 4$

$= \boxed{4x^2 - 8x}$

$(f \cdot g)(x) = (3x^2 - 4)(x^2 - 8x + 4)$

$= 3x^4 - 24x^3 + 12x^2 - 4x^2 + 32x - 16$

$= \boxed{3x^4 - 24x^3 + 8x^2 + 32x - 16}$

$(f-g)(x) = (3x^2 - 4) - (x^2 - 8x + 4)$

$= \boxed{2x^2 + 8x - 8}$

$\left(\frac{f}{g}\right)(x) = \boxed{\frac{3x^2 - 4}{x^2 - 8x + 4}, \; x \neq 4 \pm 2\sqrt{3}}$

$x = \frac{8 \pm \sqrt{(-8)^2 - 4(1)(4)}}{2(1)} = \frac{8 \pm \sqrt{48}}{2}$

$= \frac{8 \pm 4\sqrt{3}}{2} = 4 \pm 2\sqrt{3}$

(16) (a) $(f+g)(x) = (200x + 25) + (175x - 15)$

$= \boxed{375x + 10}$

(b) $(f-g)(x) = (200x + 25) - (175x - 15)$

$= \boxed{25x + 40}$

(64) $7(x-4) = 44 - 11x$

$7x - 28 = 44 - 11x$

$+11x \qquad +11x$

$18x - 28 = 44$

$+28 \quad +28$

$18x = 72$

$\boxed{x = 4 \quad D}$

(65) $2(x+5)^2 - (x^2 + 9x + 21)$

$= 2(x^2 + 10x + 25) - (x^2 + 9x + 21)$

$= (2x^2 + 20x + 50) - (x^2 + 9x + 21$

$= \boxed{x^2 + 11x + 29 \quad G}$

(66) $\frac{8 + 17 + 6 + x}{4} = 10$

$31 + x = 40$

$\boxed{x = 9 \text{ games}}$