ALGEBRA 2 PPP Solutions Last Test

1) A) Not a function - Two 4's as x-coordinates

B) Yes: $D = \{A, B, C, D\}$

$R = \{7, 8, 9, 10\}$

2) A) $f(0) = 7 \cdot 0^2 - 0 + 11 = 11$

B) $f(-5) = 7(-5)^2 - (-5) + 11 = 7 \cdot 25 + 5 + 11 = 175 + 5 + 11 = 191$

C) $f(8) = 7 \cdot 8^2 - 8 + 11 = 7 \cdot 64 - 8 + 11 = 448 - 8 + 11 = 451$

D) $f(E) = 7E^2 - E + 11$

E) $f(2a) = 7(2a)^2 - 2a + 11 = 7 \cdot 4a^2 - 2a + 11 = 28a^2 - 2a + 11$

3) A) $f(0) = -1$

B) $f(-2) = -2$

C) $f(x) = -2$ when $x = -2$ and $x = 3$

D) $D = (-3, 3]$

$R = [-2, 1)$

4) A) $D = (-\infty, \infty)$

B) $x \neq -10$ so $D = (-\infty, -10) \cup (-10, \infty)$

5) A) $(f+g)(x) = 4x^2 + 7x - 1 + 5 - 7x = 4x^2 + 4$

B) $(f+g)(-2) = 4(-2)^2 + 4 = 4 \cdot 4 + 4 = 16 + 4 = 20$

6) A) $(f+g)(3) = (8 + 3 \cdot 3) + (8 \cdot 3 - 3^2) = 8 + 9 + 24 - 9 = 32$

B) $(g-f)(x) = (8x - x^2) - (8 + 3x) = 8x - x^2 - 8 - 3x = -x^2 + 5x - 8$

C) $f(-2) - g(-2) = (8 + 3(-2)) - (8(-2) - (-2)^2) = (8 - 6) - (-16 - 4)$

$= 2-(-20) = 22$

D) $(fg)(x) = (8+3x)(8x-x^2)$

$= 64x - 8x^2 + 24x^2 - 3x^3$

$= -3x^3 + 16x^2 + 64x$

E) $\left(\frac{f}{g}\right)(-5) = \frac{8+3(-5)}{8(-5)-(-5)^2} = \frac{8-15}{-40-25} = \frac{-23}{-65} = \frac{23}{65}$

F) $\left(\frac{g}{f}\right)(6) = \frac{8\cdot 6 - 6^2}{8+3\cdot 6} = \frac{48-36}{8+18} = \frac{12}{26} = \frac{6}{13}$

7) A) $(f\circ g)(x) = 4(8+x^2)-1 = 32+4x^2-1 = 4x^2+31$

B) $(g\circ f)(x) = 8+(4x-1)^2 = 8+16x^2-8x+1 = 16x^2-8x+9$

C) $(g\circ f)(-1) = 16(-1)^2 - 8(-1) + 9 = 16+8+9 = 33$

8) $f(g(x)) = 8\left(\frac{x-7}{8}\right)+7 = x-7+7 = x$

$g(f(x)) = \frac{8x+7-7}{8} = \frac{8x}{8} = x$

9) A) $f(x) = 8+5x$

$y = 8+5x$

$x = 8+5y$

$-8 \quad -8$

$\frac{x-8}{5} = \frac{5y}{5}$

$\frac{x-8}{5} = y$

$f^{-1}(x) = \frac{x-8}{5}$

B) $f(x) = \frac{10+x}{3}$

$y = \frac{10+x}{3}$

$3\cdot x = \left(\frac{10+y}{3}\right)3$

$3x = 10+y$

$-10 \quad -10$

$3x-10 = y$

$f^{-1}(x) = 3x-10$

10)