Seminar Test Practice

① (a) $\boxed{\mathbb{R} - \{2\}}$

(b) $x^2 - 4 = 0$

$(x+2)(x-2) = 0$

$x = \pm 2$

$\boxed{\mathbb{R} - \{\pm 2\}}$

(c) $x^2 - x - 6 = 0$

$(x-3)(x+2) = 0$

$x = 3$ or -2

$\boxed{\mathbb{R} - \{-2, 3\}}$

(d) 1 | 1 −3 −6 8

1 −2 −8

1 −2 −8 | 0

$(x-1)(x^2 - 2x - 8) = 0$

$(x-1)(x-4)(x+2) = 0$

$x = -2, 1,$ or 4

$\boxed{\mathbb{R} - \{-2, 1, 4\}}$

(e) 1 | 1 1 −8 −12

1 2 −6

1 2 −6 | −18

−1 | 1 1 −8 −12

−1 0 8

1 0 −8 | −4

2 | 1 1 −8 −12

2 6 −4

1 3 −2 | −16

−2 | 1 1 −8 −12

−2 2 12

1 −1 −6 | 0

$(x+2)(x^2 - x - 6) = 0$

$(x+2)(x-3)(x+2) = 0$

$x = -2, 3$

$\boxed{\mathbb{R} - \{-2, 3\}}$

(f) −1 | 1 12 47 60

−1 −11 −36

1 11 36 | 24

−2 | 1 12 47 60

−2 −20 −54

1 10 27 | 6

−3 | 1 12 47 60

−3 −27 −60

1 9 20 | 0

$(x+3)(x^2 + 9x + 20) = 0$

$(x+3)(x+4)(x+5) = 0$

$x = -5, -4, -3$

$\boxed{\mathbb{R} - \{-5, -4, -3\}}$

(2) (a) $\boxed{-2}$

(b) $f(x) = \dfrac{x-2}{(x-2)(x+2)} = \dfrac{1}{x+2}, x \neq 2$

$\boxed{\text{no } x\text{-intercept}}$

(c) $f(x) = \dfrac{(x+3)(x-3)}{(x-3)(x+2)} = \dfrac{x+3}{x+2}, x \neq 3$

$\boxed{-3}$

(d) $f(x) = \dfrac{(x+2)(x-2)}{(x-1)(x-4)(x+2)} = \dfrac{x-2}{(x-1)(x-4)}$ $x \neq -2$

see 1d

$\boxed{2}$

(3) (a) $\boxed{x = 2}$

(b) $f(x) = \dfrac{x-2}{(x-2)(x+2)} = \dfrac{1}{x+2}, x \neq 2$

$\boxed{x = -2}$

(c) $f(x) = \dfrac{(x+3)(x-3)}{(x-3)(x+2)} = \dfrac{x+3}{x+2}, x \neq 3$

$\boxed{x = -2}$

(d) $f(x) = \dfrac{(x-2)(x+2)}{(x-1)(x-4)(x+2)} = \dfrac{x-2}{(x-1)(x-4)}, x \neq -2$

$\boxed{x = 1,\ x = 4}$