

Pre-Calculus midterm review answers:

1. a) $y = \frac{4}{3}x + \frac{32}{3}$, b) $y = \pm\sqrt{\frac{1}{2}x+2}$, c) $y = \frac{1}{3}x^2 + \frac{7}{3}$, 2. a) $2x^2 + x - 3$, b) $2x^2 - 7x + 7$, c) $32x^2 - 68x + 37$,

d) $-8x^2 + 12x - 3$ 3. a) $(-1, 8)$, b) $x = -1$, c) $(0, 5)$, d) $(-2.63, 0)$, $(.63, 0)$ 4. a) $x =$ bottles of water, $y =$ med kits,
b) $20x + 10y \leq 80000$, $x + y \leq 6000$, c) $(0, 6000)$, $(4000, 0)$, $(2000, 4000)$, $(0, 0)$, d) $P = 10x + 6y$ e) 2000 bottles and
4000 med kits, 5. a) $(x^2 - 2)(3x - 2)$ b) $(2x - 3)(2x + 3)(4x^2 + 9)$ c) $(3x + 1)(9x^2 - 3x + 1)$ d) $2(4x - 3)(x + 4)$

6. $y = -\frac{1}{8}x^3 + \frac{3}{4}x^2 - 4$ 7. a) $\pm(1, 2, 3, 4, 6, 8, 12, 24)$, b) $-3, (x+3)$ 2, $(x-2)$ c) $y = (x+3)(x-2)(x^2 + 4)$,
 $x = -3, x = 2, x = 2i, x = -2i$

$$8. f(x) = \begin{cases} -(x+7)^2 + 8, & x \in [-10, -5] \\ 2, & x \in (-5, 0] \\ -\frac{1}{4}(x-4)^2, & x \in (0, \infty) \end{cases}$$

9. a) $\frac{2(x-1)}{3}$, b) $-\frac{3(x-2)}{10}$, c) $\frac{7x^2 - 65x + 22}{5(x+3)(x-2)}$, d) $\frac{-25x^2 + 2x + 8}{(3x-2)(x+5)(x-2)}$

10. a) $x = -3 \pm 4\sqrt{2}$ or $x \approx -8.66, 2.66$, b) 7 or 1, c) -1, d) -3 e) $\frac{7x^2 - 65x + 22}{5(x+3)(x-2)}$