Sec 2.3 page 111 day 1 (1, 2, 3, 5, 7, 9-14)

(1) a) $4 + 5(-2) = -6$ b) -8

c) 2 d) $\frac{4(3)}{-2} = -6$

e) DNE f) $\frac{0}{4} = 0$

(2) a) $2 + 0 = 2$ b) DNE c) 0

d) DNE e) $8(2) = 16$ f) 2

(3) $\lim_{x \to -2} (3x^4 + 2x^2 - x + 1) = \lim_{x \to -2} 3x^4 + \lim_{x \to -2} 2x^2 - \lim_{x \to -2} x + \lim_{x \to -2} 1$

$= 3\lim_{x \to -2} x^4 + 2\lim_{x \to -2} x^2 - -2 + 1$

$= 3\left(\lim_{x \to -2} x\right)^4 + 2\left(\lim_{x \to -2} x\right)^2 + 3 = 3(16) + 2(4) + 3$

$= \boxed{59}$

(5) $\lim_{x \to 8} (1 + \sqrt[3]{x})(2 - 6x^2 + x^3) = \lim_{x \to 8} (1 + \sqrt[3]{x}) \cdot \lim_{x \to 8} (2 - 6x^2 + x^3)$

$= \left(\lim_{x \to 8} 1 + \lim_{x \to 8} \sqrt[3]{x}\right) \cdot \left(\lim_{x \to 8} 2 - 6\lim_{x \to 8} x^2 + \lim_{x \to 8} x^3\right)$

$= \left(1 + \sqrt[3]{\lim_{x \to 8} x}\right) \cdot \left(2 - 6\left(\lim_{x \to 8} x\right)^2 + \left(\lim_{x \to 8} x\right)^3\right)$

$= (1 + 2) \cdot (2 - 6(64) + 8^3) = 3(130) = \boxed{390}$

(7) $\lim_{x\to 2}\sqrt{\frac{2x^2+1}{3x-2}} = \sqrt{\lim_{x\to 2}\left(\frac{2x^2+1}{3x-2}\right)}$

$= \sqrt{\frac{\lim_{x\to 2} 2x^2 + \lim_{x\to 2} 1}{\lim_{x\to 2} 3x - \lim_{x\to 2} 2}} = \sqrt{\frac{2\left(\lim_{x\to 2} y\right)^2 + 1}{3\lim_{x\to 2} x - 2}}$

$= \sqrt{\frac{2(4)+1}{3(2)-2}} = \sqrt{\frac{9}{4}} = \boxed{\frac{3}{2}}$

(9) $\lim_{x\to 5}\frac{x^2-6x+5}{x-5} = \lim_{x\to 5}\frac{(x-5)(x-1)}{(x-5)} = 4$

(10) $\lim_{x\to 4}\frac{x^2-4x}{x^2-3x-4} = \lim_{x\to 4}\frac{x(x-4)}{(x-4)(x+1)} = \frac{4}{5}$

(11) $\lim_{x\to 5}\frac{x^2-5x+6}{x-5} = DNE$

(12) $\lim_{x\to -1}\frac{2x^2+3x+1}{x^2-2x-3} = \frac{(2x+1)(x+1)}{(x+1)(x-3)} = \frac{-1}{-4} = \frac{1}{4}$

(13) $\lim_{t\to -3}\frac{t^2-9}{2t^2+7t+3} = \lim_{t\to -3}\frac{(t+3)(t-3)}{(2t+1)(t+3)} = \frac{-6}{-5} = \frac{6}{5}$

(14) $\lim_{t\to -1}\frac{x^2-4x}{x^2-3x-4} = \lim_{t\to -1}\frac{x(x-4)}{(x-4)(x+1)} = \frac{-1}{0} \therefore DNE$