

one Page

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Hmwk 2.4

Hmwk 2.4 Pg. 115 (1, 3, 9, 23, 27, 37, 53, 63, 73, 75, 76)

1. 3 3. 3

$$9. f(x) = x^2 + 1 \quad \lim_{x \rightarrow 2} f(x) = 5$$

x	1.9	1.99	1.999	2.001	2.01	2.1
f(x)	4.61	4.9601	4.996001	5.004001	5.0401	5.41

$$23. \quad \lim_{x \rightarrow 2} 3 = 3$$

$$27. \quad \lim_{x \rightarrow 1} (1 - 2x^2) = -1$$

$$37. \quad \lim_{x \rightarrow -3} \sqrt{2x^4 + x^2} = \sqrt{2(-3)^4 + (-3)^2} = \sqrt{171} = 3\sqrt{19}$$

$$53. \quad \lim_{x \rightarrow -5} \frac{x^2 - 25}{x + 5} = \lim_{x \rightarrow -5} \frac{(x+5)(x-5)}{(x+5)} = -10$$

$$63. \quad \lim_{x \rightarrow \infty} f(x) = +\infty ; \quad \lim_{x \rightarrow -\infty} f(x) = +\infty \quad \text{both rise forever}$$

$$73. \quad \lim_{x \rightarrow \infty} \frac{3x+2}{x-5} = \lim_{x \rightarrow \infty} \frac{3 + \frac{2}{x}}{1 - \frac{5}{x}} = \frac{3+0}{1-0} = 3$$

$$75. \quad \lim_{x \rightarrow -\infty} \frac{3x^3 + x^2 + 1}{x^3 + 1} = \lim_{x \rightarrow -\infty} \frac{3 + \frac{1}{x} + \frac{1}{x^3}}{1 + \frac{1}{x^3}} = \frac{3+0+0}{1+0} = 3$$

$$76. \quad \lim_{x \rightarrow \infty} \frac{2x^2 + 3x + 1}{x^3 - x^2} = \lim_{x \rightarrow \infty} \frac{(2x+1)(x+1)}{x^2(x+1)(x-1)} = 3$$
$$= \lim_{x \rightarrow \infty} \frac{2x+1}{x^3 - x^2} = \lim_{x \rightarrow \infty} \frac{\frac{2}{x} + \frac{1}{x^2}}{1 - \frac{1}{x}} = 0$$