

# Worksheet 2.2-2 Answer Key

Evaluate the following.

$$1) \lim_{x \rightarrow 0^-} \frac{1}{x} = -\infty$$

(VA problem)

$$2) \lim_{x \rightarrow 0^+} \frac{1}{x} = \infty$$

(VA problem)

$$3) \lim_{x \rightarrow 0} \frac{1}{x} = \text{DNE}$$

(see 1 & 2)  
(VA problem)

$$4) \lim_{x \rightarrow \infty} \frac{1}{x} = \frac{S}{B} = 0$$

$$5) \lim_{x \rightarrow 0} \frac{1}{x^2} = \infty$$

$x \rightarrow 0^+ = \infty$   
 $x \rightarrow 0^- = \infty$   
(VA problem)

$$6) \lim_{x \rightarrow \infty} \frac{2-6x}{5x+1} = \frac{\text{same}}{\text{same}} = \frac{-6}{5}$$

$$7) \lim_{x \rightarrow \infty} \frac{3x-1}{2x+1} = \frac{\text{same}}{\text{same}} = \frac{3}{2}$$

$$8) \lim_{x \rightarrow \infty} \frac{7x^2+3x+1}{2x^2+6} = \frac{\text{same}}{\text{same}} = \frac{7}{2}$$

$$9) \lim_{x \rightarrow \infty} \frac{16x^4-3}{5x^4+x^3-8} = \frac{\text{same}}{\text{same}} = \frac{16}{5}$$

$$10) \lim_{x \rightarrow \infty} \frac{1}{x^2+1} = \frac{S}{B} = 0$$

$$11) \lim_{x \rightarrow \infty} \frac{x}{x^3+2} = \frac{S}{B} = 0$$

$$12) \lim_{x \rightarrow \infty} \frac{5}{2x} = \frac{S}{B} = 0$$

$$13) \lim_{x \rightarrow \infty} \frac{2x^2+1}{x} = \frac{B}{S} = \infty$$

$\frac{+}{+}$

$$14) \lim_{x \rightarrow \infty} \frac{3x^3+x}{5} = \frac{B}{S} = -\infty$$

$\frac{-}{+}$

$$15) \lim_{x \rightarrow \infty} \frac{x^2-3x+1}{x-4} = \frac{B}{S} = \infty$$

$\frac{+}{+}$

$$16) \lim_{x \rightarrow \infty} \frac{1}{x^2} = \frac{S}{B} = 0$$

$$17) \lim_{x \rightarrow 2^+} \frac{x+1}{x+2} = \frac{3}{4}$$

(substitute in 2)

$$18) \lim_{x \rightarrow 5^+} \frac{x^2-25}{x-5} = 10$$

(cancel  $x-5$ , then substitute in 5)

$$19) \lim_{x \rightarrow -\infty} \frac{x^2 - 1}{x - 1} = -\infty$$

$\frac{+}{-}$

$$20) \lim_{x \rightarrow \infty} \frac{2x}{9} = \infty$$

$\frac{+}{+}$

$$21) \lim_{x \rightarrow \infty} 3 = 3$$

(constant!!)

$$22) \lim_{x \rightarrow \infty} \frac{x}{x - 3} = 1$$

(same / same)

$$23) \lim_{x \rightarrow 6^+} \frac{x + 6}{x^2 - 36} = \infty$$

(VA problem)

$$24) \lim_{x \rightarrow 0} \frac{6x - 9}{x^3 - 12x + 3} = -3$$

(substitute in 0)

$$25) \lim_{x \rightarrow 0^+} (5x - 1) = -1$$

(substitute in 0)

$$26) \lim_{x \rightarrow 6} \frac{x + 6}{x^2 - 36} = \text{DNE}$$

$x \rightarrow 6^+ = \infty$   
 $x \rightarrow 6^- = -\infty$   
 (VA problem)

$$27) \lim_{x \rightarrow \infty} \frac{6x^2 - 9}{x^3 - 12x + 3} = 0$$

$$28) \lim_{x \rightarrow 4^+} \frac{3}{x - 4} = \infty$$

(VA problem)

$$29) \lim_{x \rightarrow 6} \frac{x - 6}{x^2 - 36} = \frac{1}{12}$$

(cancel x-6, then substitute in 6)

$$30) \lim_{x \rightarrow 2} \frac{x^2 - 4x + 4}{x^2 + x - 6} = 0$$

$\frac{(x-2)(x-2)}{(x-2)(x+3)}$   
 (cancel x-2, then substitute in 2)

$$31) \lim_{x \rightarrow 4^-} \frac{3}{x - 4} = -\infty$$

(VA problem)

$$32) \lim_{x \rightarrow \infty} \frac{x - 6}{x^2 - 36} = 0$$

$$33) \lim_{x \rightarrow -2} \frac{x^2 - 4x + 4}{x^2 + x - 6} = -4$$

(substitute in -2)

$$34) \lim_{x \rightarrow 4} \frac{3}{x - 4} = \text{DNE}$$

$x \rightarrow 4^+ = \infty$   
 $x \rightarrow 4^- = -\infty$   
 (VA problem)

$$35) \lim_{x \rightarrow \infty} \frac{3 + x^2}{5 - 2x^2} = -\frac{1}{2}$$

(same / same)

$$36) \lim_{x \rightarrow \infty} \frac{x^2 - 4x + 4}{x^2 + x - 6} = 1$$

(same / same)

$$37) \lim_{x \rightarrow \infty} \frac{(2 - x^2)}{1} = -\infty$$

$\frac{-}{+}$

$$38) \lim_{x \rightarrow \infty} \frac{3 - 4x - x^2}{x + 1} = -\infty$$

$\frac{-}{+}$

$$39) \lim_{x \rightarrow 3^-} \frac{x}{x - 3} = -\infty$$

(VA problem)

$$40) \lim_{x \rightarrow \infty} \frac{(2 - x)}{1} = -\infty$$

$\frac{-}{+}$

$$41) \lim_{x \rightarrow \infty} \frac{5 - x^2}{x} = -\infty$$

$\frac{-}{+}$

$$42) \lim_{x \rightarrow \infty} \frac{x^2}{x - 3} = \infty$$

$\frac{+}{+}$