Student: _____	Instructor: Garth Isaak	Assignment: Polynomial etc functions
Date: _____	Course: precalc blitzer (1)	practice diagnostic 1b
Time: _____	Book: Blitzer: Precalculus Essentials, 3e	

1.   Find the x-intercepts of the polynomial function. State whether the graph crosses the x-axis, or touches the x-axis and turns around, at each intercept.

$$f(x) = (x - 2)^2 (x^2 - 25)$$

- A. -2, touches the x-axis and turns around;
  25, crosses the x-axis

- B. 2, touches the x-axis and turns around;
  25, touches the x-axis and turns around

- C. 2, touches the x-axis and turns around;
  -5, crosses the x-axis;
  5, crosses the x-axis

- D. 2, touches the x-axis and turns around;
  -5, touches the x-axis and turns around;
  5, touches the x-axis and turns around

2.   Divide.

$$\frac{x^4 + 81}{x - 3}$$

- A. $x^3 - 3x^2 + 9x - 27 + \dfrac{162}{x - 3}$

- B. $x^3 + 3x^2 + 9x + 27 + \dfrac{81}{x - 3}$

- C. $x^3 + 3x^2 + 9x + 27 + \dfrac{162}{x - 3}$

- D. $x^3 + 3x^2 + 9x + 27$

3.   Find the horizontal asymptote, if any, of the graph of the rational function.

$$g(x) = \frac{12x^2}{3x^2 + 1}$$

- A. $y = \dfrac{1}{4}$

- B. $y = 4$

- C. $y = 0$

- D. no horizontal asymptote

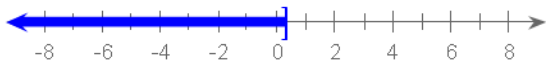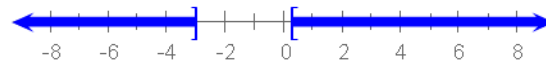| Student: _____ | Instructor: Garth Isaak | Assignment: Polynomial etc functions |
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4. Solve the polynomial inequality and graph the solution set on a number line. Express the solution set in interval notation.

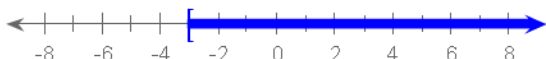$(3x - 1)(x + 3) \leq 0$

A. $(-\infty, (1/3)]$

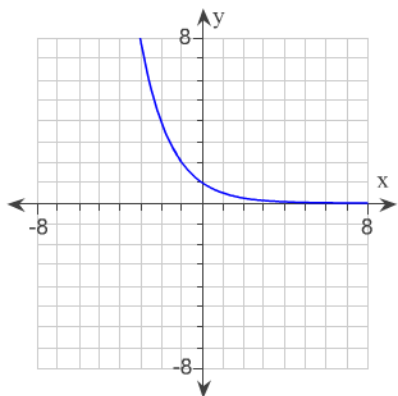B. $(-\infty, -3] \cup [(1/3), \infty)$

C. $[-3, \infty)$

D. $[-3, (1/3)]$

5. The graph of an exponential function is given. Select the function for the graph from the functions listed.

A. $f(x) = -2^{-x}$

B. $f(x) = -2^x$

C. $f(x) = 2^{-x}$

D. $f(x) = 2^x$

6. Evaluate or simplify the expression without using a calculator.

$\ln e$

A. e

B. -1

C. 1

D. 0

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7.   Solve the equation by expressing each side as a power of the same base and then equating exponents.

$$e^{x+10} = \frac{1}{e^6}$$

- ○A. $\{-16\}$
- ○B. $\{4\}$
- ○C. $\{-4\}$
- ○D. $\{16\}$

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1.   C

2.   C

3.   B

4.   D

5.   C

6.   C

7.   A