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

1. Write the equation of a polynomial function with the given characteristics. Use a leading coefficient of 1 or -1 and make the degree of the function as small as possible.

   Touches the x-axis at 0 and crosses the x-axis at 2; lies below the x-axis between 0 and 2.

   ○ A. $f(x) = -x^3 - 2x^2$

   ○ B. $f(x) = x^3 + 2x^2$

   ○ C. $f(x) = -x^3 + 2x^2$

   ○ D. $f(x) = x^3 - 2x^2$

2. Find the domain of the rational function.

   $$g(x) = \frac{x + 9}{x^2 - 64}$$

   ○ A. $\{x | x \neq 0, x \neq 64\}$

   ○ B. $\{x | x \neq -8, x \neq 8\}$

   ○ C. all real numbers

   ○ D. $\{x | x \neq -8, x \neq 8, x \neq -9\}$

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

   $$f(x) = \frac{x^2 - 7x + 3}{x + 9}$$

   ○ A. $y = x - 16$

   ○ B. $x = y + 7$

   ○ C. $y = x + 10$

   ○ D. no slant asymptote

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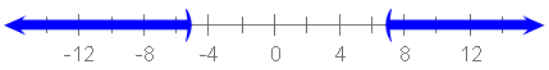
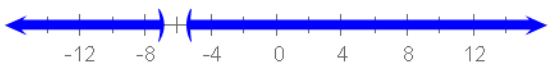
4. Solve the rational inequality and graph the solution set on a real number line. Express the solution set in interval notation.

$$\frac{x+17}{x+7} < 7$$

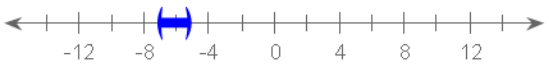
A. $(-\infty, -\frac{16}{3})$ or $(7,\infty)$



B. $(-\infty, -7)$ or $(-\frac{16}{3},\infty)$



C. $(-7, -\frac{16}{3})$



D. $\varnothing$

5. Evaluate the expression without using a calculator.

$\log_5 \sqrt{5}$

A. $\frac{1}{2}$

B. $\frac{1}{5}$

C. 1

D. 5

6. Use properties of logarithms to condense the logarithmic expression. Write the expression as a single logarithm whose coefficient is 1. Where possible, evaluate logarithmic expressions.

$4 \log_b y + 8 \log_b z$

A. $32 \log_b yz$

B. $\log_b (yz)^{12}$

C. $\log_b y^4 z^8$

D. $12 \log_b yz$

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7. Use properties of logarithms to condense the logarithmic expression. Write the expression as a single logarithm whose coefficient is 1. Where possible, evaluate logarithmic expressions.

$\log x + \log (x^2 - 25) - \log 3 - \log (x - 5)$

A. $\log \dfrac{x(x-25)(x-5)}{3}$

B. $\log \dfrac{x(x-25)}{3(x-5)}$

C. $\log \dfrac{x(x+5)}{3}$

D. $\log \dfrac{(2x+5)}{(8-x)}$

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1. D

2. B

3. A

4. B

5. A

6. C

7. C