Student: _____	**Instructor:** Garth Isaak	**Assignment:** Polynomial etc functions
Date: _____	**Course:** precalc blitzer (1)	practice diagnostic 3a
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.

   Crosses the x-axis at -4, 0, and 2; lies below the x-axis between -4 and 0; lies above the x-axis between 0 and 2.

   ○A. $f(x) = x^3 + 2x^2 - 8x$

   ○B. $f(x) = -x^3 + 2x^2 + 8x$

   ○C. $f(x) = -x^3 - 2x^2 + 8x$

   ○D. $f(x) = x^3 - 2x^2 - 8x$

2. Find the domain of the rational function.

   $$g(x) = \frac{x+6}{x^2+1}$$

   ○A. $\{x|x \neq -1, x \neq 1, x \neq -6\}$

   ○B. all real numbers

   ○C. $\{x|x \neq -1, x \neq 1\}$

   ○D. $\{x|x \neq 0, x \neq -1\}$

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

   $$f(x) = \frac{x^3+2}{x^2-25}$$

   ○A. $y = x - 25$

   ○B. $y = x + 2$

   ○C. $y = x$

   ○D. no slant asymptote

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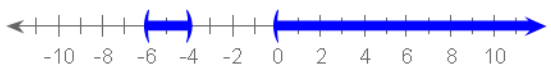
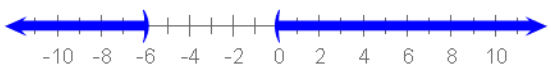
4. Solve the rational inequality and graph the solution set on a real number line. Express the solution set in interval notation.

$$\frac{2x}{x+6} < x$$

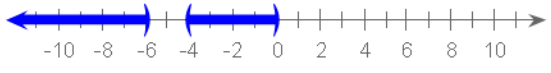
A. $(-6,-4) \cup (0,\infty)$



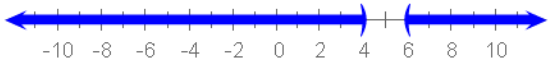
B. $(-\infty,-6) \cup (0,\infty)$



C. $(-\infty,-6) \cup (-4,0)$



D. $(-\infty,4) \cup (6,\infty)$



5. Evaluate the expression without using a calculator.

$$\log_7 \frac{1}{\sqrt{7}}$$

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

B. $\frac{1}{7}$

C. $-\frac{1}{7}$

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

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.

$$7 \log_b y + 3 \log_b z$$

A. $\log_b (yz)^{10}$

B. $\log_b y^7 z^3$

C. $21 \log_b yz$

D. $10 \log_b yz$

7. Solve the logarithmic equation. Be sure to reject any value that is not in the domain of the original logarithmic expressions. Give the exact answer.

$\ln(x-7) - \ln(x+10) = \ln(x-1) - \ln(x+1)$

A. $\{(-17/15)\}$

B. $\varnothing$

C. $\{(3/1)\}$

D. $\{(3/15)\}$

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1. C

2. B

3. C

4. A

5. A

6. B

7. D