| Student: _____ | Instructor: Garth Isaak | Assignment: Functions and graphs practice |
| Date: _____ | Course: precalc blitzer (1) | diagnostic 2b |
| Time: _____ | Book: Blitzer: Precalculus Essentials, 3e | |

1.  Evaluate the function at the given value of the independent variable and simplify.

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

○ A.  $-\dfrac{25}{9}$

○ B.  $\dfrac{11}{12}$

○ C.  $-\dfrac{25}{12}$

○ D.  $-\dfrac{9}{4}$

2.  Find and simplify the difference quotient $\dfrac{f(x + h) - f(x)}{h}$, $h \neq 0$ for the given function.

$$f(x) = x^2 + 6x + 4$$

○ A.  $2x + h + 4$

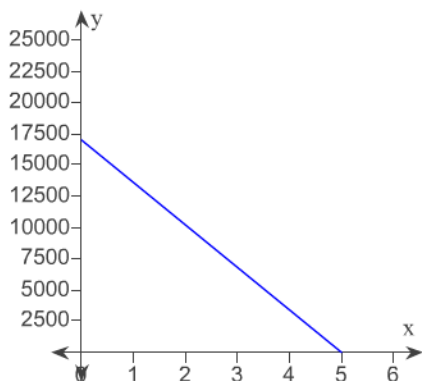○ B.  $1$

○ C.  $2x + h + 6$

○ D.  $\dfrac{2x^2 + 2x + 2xh + h^2 + h + 8}{h}$

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3. A school has just purchased new computer equipment for $17,000.00. The graph shows the depreciation of the equipment over 5 years. The point (0,17000) represents the purchase price and the point (5,0) represents when the equipment will be replaced. Write a linear equation in slope-intercept form that models the value of the equipment, y, x years after purchase. Use the model to predict the value of the equipment after 3 years?

   ○A. $y = 17,000x + 5$;
   the value after 3 years is $6,800.00

   ○B. $y = 3400x - 17,000$;
   the value after 3 years is $6,800.00

   ○C. $y = -17,000x + 17,000$;
   the value after 3 years is $ -34,000.00

   ○D. $y = -3400x + 17,000$;
   the value after 3 years is $6,800.00



4. Find the domain of the function.

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

   ○A. $(9,\infty)$

   ○B. $(-\infty, -3) \cup (-3,3) \cup (3,\infty)$

   ○C. $(-\infty,\infty)$

   ○D. $(-\infty,0) \cup (0,\infty)$

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5.      For the given functions f and g, find the indicated composition.

$$f(x) = \frac{5}{x+6}, \ g(x) = \frac{2}{3x}; \ (f \circ g)(x)$$

- A. $\dfrac{2x+12}{15x}$

- B. $\dfrac{5x}{2+18x}$

- C. $\dfrac{15x}{2-18x}$

- D. $\dfrac{15x}{2+18x}$

6.      Find functions f and g so that $h(x) = (f \circ g)(x)$.

$$h(x) = \frac{9}{\sqrt{2x+5}}$$

- A. $f(x) = 9, \ g(x) = \sqrt{2+5}$
- B. $f(x) = 9/x, \ g(x) = 2x+5$
- C. $f(x) = 9/\sqrt{x}, \ g(x) = 2x+5$
- D. $f(x) = \sqrt{2x+5}, \ g(x) = 9$

7.      Determine which two functions are inverses of each other.

$$f(x) = x^5 - 9, \ g(x) = \sqrt[5]{x-9}, \ h(x) = x^5 + 9$$

- A. f(x) and h(x)

- B. g(x) and h(x)

- C. f(x) and g(x)

- D. None

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1.     C

2.     C

3.     D

4.     B

5.     D

6.     C

7.     B