

Name: Key

Date: \_\_\_\_\_

COMMON ALGEBRAIC EXPRESSIONS  
COMMON CORE ALGEBRA II HOMEWORK

FLUENCY

1. Which of the following expressions has the greatest value when  $x=5$ ? Show how you arrived at your choice.

$2x^2 + 7$   
 $2(5)^2 + 7$   
 $2(25) + 7$   
 $50 + 7$   
 $57$

$\frac{x^3 - 5}{3}$   
 $\frac{(5)^3 - 5}{3} \Rightarrow \frac{125 - 5}{3}$   
 $\Rightarrow \frac{120}{3} \Rightarrow 40$

$\frac{10x - 2}{x - 3} \Rightarrow \frac{10(5) - 2}{5 - 3}$   
 $\Rightarrow \frac{50 - 2}{2} \Rightarrow \frac{48}{2}$   
 $\Rightarrow 24$

2. A zero of an expression is a value of the input variable that results in the expression having a value of zero (catchy and appropriate name). Is  $x=3$  a zero of the quadratic expression shown below? Justify your yes/no answer.

$4x^2 - 8x - 12$

$4(3)^2 - 8(3) - 12$   
 $4(9) - 24 - 12$   
 $36 - 36 = 0 \checkmark$

Yes

3. Which of the following is the value of the rational expression  $\frac{2 - 3x^2}{6x + 4}$  when  $x = -2$ ?

(1)  $-2\frac{1}{2}$

(3)  $1\frac{1}{4}$

$\frac{2 - 3(-2)^2}{6(-2) + 4} \Rightarrow \frac{2 - 3(4)}{-12 + 4} \Rightarrow \frac{2 - 12}{-8} \Rightarrow \frac{-10}{-8} = \frac{5}{4}$

(2)  $-\frac{5}{8}$

(4)  $\frac{2}{7}$

$\frac{5}{4} \Rightarrow 1\frac{1}{4}$

(3)

4. If  $x=5$  and  $y=-2$  then  $\frac{x+y}{x^2 - y^2}$  is

(1)  $\frac{1}{7}$

(3)  $\frac{3}{29}$

$\frac{5 - 2}{(5)^2 - (-2)^2} \Rightarrow \frac{3}{25 - 4} \Rightarrow \frac{3}{21} \Rightarrow \frac{1}{7}$

(2)  $\frac{13}{3}$

(4)  $\frac{7}{19}$

(1)



5. What is the value of  $\|x-10|-|x+3\|$  if  $x=2$ ?  $\left| |2-10| - |2+3| \right|$

(1) 7                      (3) 3                       $\Rightarrow |1-8| - |5|$

(2) 5                      (4) 17                       $\Rightarrow |8-5| \Rightarrow |3| = \boxed{3}$                       (3)

6. If  $x=2$  then  $\frac{\sqrt{4x^2+2x+5}}{10}$  has a value of  $\frac{\sqrt{4(2)^2+2(2)+5}}{10} \Rightarrow \frac{\sqrt{4(4)+4+5}}{10}$

(1)  $\frac{5}{2}$                       (3)  $\frac{2}{5}$

(2)  $\frac{7}{5}$                       (4)  $\frac{1}{2}$                        $\Rightarrow \frac{\sqrt{16+9}}{10} \Rightarrow \frac{\sqrt{25}}{10} = \frac{5}{10} = \boxed{\frac{1}{2}}$                       (4)

**APPLICATIONS**

7. The revenue, in dollars, that eMathInstruction makes off its videos in a given day depends on how many views they receive. If  $x$  represents the number of views, in hundreds, then the profit can be found with the expression:

$$\frac{1}{2}x^2 + 6x - 10$$

How much revenue would they make if their videos were viewed 600 times?  $600 \text{ times} \rightarrow x=6$

$$\frac{1}{2}(6)^2 + 6(6) - 10 \rightarrow 18 + 26$$

$$\Rightarrow \frac{1}{2}(36) + 36 - 10 \Rightarrow 44 \therefore \boxed{\$44}$$

**REASONING**

8. Sameer believes that the two expressions below are equivalent. Test values and see if you can build evidence for or against this belief.

$$(x-3)(x+8) \qquad x^2 + 5x - 24$$

$\Rightarrow x^2 + 8x - 3x - 24$

$\Rightarrow x^2 + 5x - 24$

$\swarrow$  they are the same

Test: when  $x=1$

$$(1-3)(1+8) = (1)^2 + 5(1) - 24$$

$$(-2)(9) = 1 + 5 - 24$$

$$-18 = -18 \checkmark$$

