64/64 = 100

# Foundations for College Algebra
## University of North Georgia
### Fall 2016
### Exam #2

Name: _Key_            Date: _November 2, 2016_

For full credit <u>ALL</u> work must be shown NEATLY on the exam. Ten points will be deducted off the top for "messy" work! Any "valid" checks are worth an additional point per question.

FOLLOW DIRECTIONS!

1. Use the chart below to place a check mark indicating which set(s) the item on the left is a member of.

| | $\mathbb{N}$ | $\mathbb{W}$ | $\mathbb{Z}$ | $\mathbb{Q}$ | $\mathbb{Q}'$ | $\mathbb{R}$ |
|---|---|---|---|---|---|---|
| -5 | | | ✓ | ✓ | | ✓ |
| $-0.005$ | | | | ✓ | | ✓ |
| $\dfrac{3}{19}$ | | | | ✓ | | ✓ |
| $-\pi$ | | | | | ✓ | ✓ |
| 5 | ✓ | ✓ | ✓ | ✓ | | ✓ |

2. True or False? Support your answer for full credit by describing the "meaning" of exponents.

$-4^2 = 16$   False

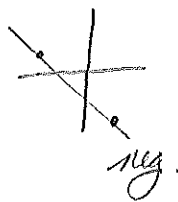$$-4^2 = (-1) \cdot 4^2$$
$$= (-1) \cdot 4 \cdot 4$$
$$= (-4) \cdot 4$$
$$= -16$$

3. Simplify

$$\dfrac{\dfrac{2}{3x} - \dfrac{1}{5}}{-\dfrac{5}{x^2}} = \dfrac{\dfrac{10-3x}{15x}}{-\dfrac{5}{x^2}} = \dfrac{10-3x}{15x} \cdot \dfrac{x^2}{5}$$

$$= \dfrac{x(10-3x)}{75} \quad or \quad \dfrac{-3x^2 + 10x}{75}$$

1

4. Find the equation, in *Slope-Intercept* form which passes through $(2, -5)$ *and* $(-4, 2)$.

$$m = \frac{(2) - (-5)}{(-4) - 2} = \frac{7}{-6}$$

neg.

$$y = -\frac{7}{6}x - \frac{8}{3}$$

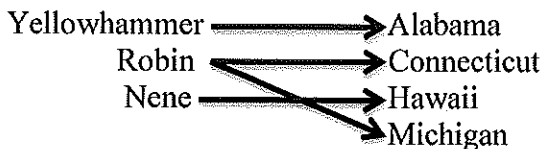$$-5 = -\frac{7}{6} \cdot \cancel{2} + b$$

$$\left(-5 = -\frac{7}{3} + 3b\right)$$

$$-15 = -7 + 3b$$

$$-8 = 3b$$

$$-\frac{8}{3} = b$$

5. Does the following *Relation* represent a *Function*? Explain your conclusion.

Yellowhammer ⟶ Alabama
Robin ⟶ Connecticut
Nene ⟶ Hawaii
⟶ Michigan

NO, Robin is paired with Connecticut & Michigan.

6. Given the rule $f: x \longrightarrow \frac{x}{(x+3)}$, where does $f$ send -1?

$$f: -1 \longrightarrow \frac{-1}{(-1+3)}$$

$$\longrightarrow -\frac{1}{2}$$

7. Given $f(x) = -2x^2 + 5x - 9$, evaluate $f(-2)$.

$$f(-2) = -2(-2)^2 + 5(-2) - 9$$

$$= -2(4) - 10 - 9$$

$$= -8 - 10 - 9$$

$$= -27$$

8. What does *Domain* mean in mathematics?

Domain is the first element of an ordered pair.

9. What is the *degree* of the following polynomial: $10x^2 - 3x^4 + x^3 \left(- x^5\right) + x$?

degree: 5

10. Simplify $\left(\dfrac{-2x^4}{-x^5}\right)^3$

$$\frac{(-2)^3 \cdot (x^4)^3}{-(x^5)^3} = \frac{-8x^{12}}{-x^{15}}$$

$$= \frac{8}{x^3}$$

11. Use the meaning of *Exponents* to multiply $(a + b)^3$

$$(a+b)^3 = (a+b)(a+b)(a+b)$$
$$= (a^2 + 2ab + b^2)(a+b)$$
$$= a^3 + a^2b + 2a^2b + 2ab^2 + ab^2 + b^3$$
$$= a^3 + 3a^2b + 3ab^2 + b^3$$

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12. Factor out the **GCF** from $16c^3 + 32c^2 + 36c$

$$4c \left( 4c^2 + 8c + 9 \right)$$

Factor the following

13. $48r(5r + 3) - (5r + 3)$

$$\left( 5r + 3 \right) \left( 48r - 1 \right)$$

14. $x^2 + 8x + 7x + 56$

$$x(x + 8) + 7(x + 8)$$

$$(x + 8)(x + 7)$$

15. $7x^2 + 14x - 8x - 16$

$$7x(x + 2) - 8(x + 2)$$

$$(x + 2)(7x - 8)$$

16. $\$(D - \%) + \ddot{O}(D - \%)$

$$(D - \%)(\$ + \ddot{O})$$