68/68 = 100

Foundations for College Algebra - MTWF
University of North Georgia
Spring 2015
Exam #2

Name: Key Date: March 30, 2016

For full credit ALL 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.

1. Seven less than eight times a certain number is negative 5. What is the number?

$8x - 7 = -5$

$8x = 2$

$\boxed{x = \frac{1}{4}}$

Let x = a certain number

check

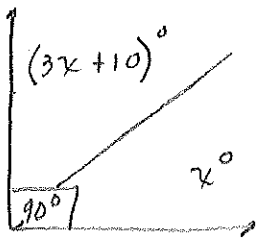
$8\left(\frac{1}{4}\right) - 7 = -5$

$2 - 7 = -5$

$-5 = -5$ ✓

2. Two angles are said to be complementary if their sum is ninety degrees. Suppose you have two complementary angles such that the second angle is ten degrees larger than three times the measure of the first angle. Find the degree measure of both angles.

Let x be the first angle.



$x + 3x + 10 = 90$

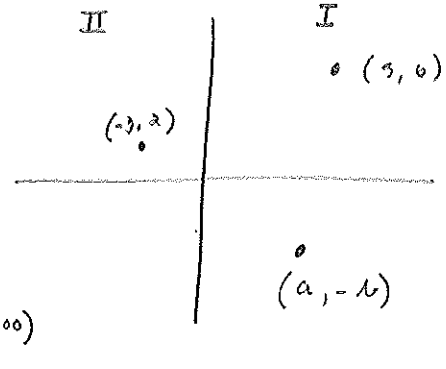
$4x = 80$

$x = 20°$

$90° - 20° = 70°$

1st angle: 20°
2nd angle: 70°
Total 90°

3. State the ***quadrant*** that the following ordered pairs (points) are located in:
   a. $(-3, 2)$ II
   b. $(a, -b)$ IV
   c. $(5, 6)$ I
   d. $(-23, -100)$ III



4. Which of the following points $(-9,49), (1,1), (-6,39), (2,-3)$ is a solution of the equation $y = -5x + 6$?

$(-9, 49)$

$49 = -5(-9) + 6$

$= 45 + 6$

$49 \neq 51$

$(1, 1)$

$1 = -5(1) + 6$

$1 = -5 + 6$

$1 = 1$ ✓

$(-6, 39)$

$39 = -5(-6) + 6$

$39 = 30 + 6$

$39 \neq 36$

$-3 = -5(2) + 6$

$-3 = -10 + 6$

$-3 \neq -4$

5. State the ***Domain*** and ***Range*** and determine if the given ***relation*** is a ***function***: $R = \{(-1,-7), (2,-5), (4,-2)\}$. You <u>MUST</u> explain your reasoning for full credit.

Domain: $\{-1, 2, 4\}$

Range: $\{-7, -5, -2\}$

R is a function

6. Given $f(x) = -2x^2 + 5x - 9$ and $g(x) = -2x^2 + 3x + 4$ evaluate $f(-2)$ *and* $g(-2)$.

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

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

$= -8 - 10 - 9$

$= -18 - 9$

$= -27$

$g(-2) = -2(-2)^2 + 3(-2) + 4$

$= -2(4) + (-6) + 4$

$= -8 - 6 + 4$

$= -14 + 4$

$= -10$

7. State the degree of the following ***term***: $-5a^5b^3c^2d$

Degree: $5+3+2+1 = 11$

8. Simply the following ***polynomial*** and write the result in descending powers of x and state the degree of the polynomial: $-4x^2y^2 + 3xy^3 + 6x^3y - xy^3 + 2x^2y^2$

$-4x^2y^2 + 2x^2y^2 + 3xy^3 - xy^3 + 6x^3y$

$-2x^2y^2 + 2xy^3 + 6x^3y$

$\boxed{6x^3y - 2x^2y^2 + 2xy^3}$ Degree: 4

9. Add or subtract as required:
$(-4x^6 + 11x^4 + 2x^3 - x + 5) - (2x^6 + 4x^5 - 3x^4 + 2x^2 - x + 3)$

$-4x^6 + 11x^4 + 2x^3 - x + 5 - 2x^6 - 4x^5 + 3x^4 - 2x^2 + x - 3$

$\boxed{-6x^6 - 4x^5 + 14x^4 + 2x^3 - 2x^2 + 2}$

10. What is the "meaning" of an exponent and give an example of its use.

Given a^n, where a is the base and n is the exponent, it tells us the number of factors of a, which are multiplied.

$(5x^2)^3 = 5x^2 \cdot 5x^2 \cdot 5x^2$
$= 5 \cdot x \cdot x \cdot 5 \cdot x \cdot x \cdot 5 \cdot x \cdot x$
$= 125x^6$

In the following, use the Laws of Exponents to simplify.

11. $(x^5y^7)(x^4y^8)$

$x^5 \cdot x^4 \cdot y^7 \cdot y^8$

$x^{5+4} \cdot y^{7+8}$

$\boxed{x^9y^{15}}$ Law #1 - Product Rule

12. $(y^{5x-5})(y^{2-3x})$

$y^{5x-5+2-3x} = \boxed{y^{2x-3}}$ Law #1 - Product Rule

13. $(-2x^4y^{-3}z^6)^3$

$(-2)^3 \cdot (x^4)^3 \cdot (y^{-3})^3 \cdot (z^6)^3$

$-8x^{12}y^{-9}z^{18}$ $\boxed{-\frac{8x^{12}z^{18}}{y^9}}$

Law #2 - Power Rule

14. $\frac{1}{(5x^3)^{-3}}$

$\frac{(5x^3)^3}{1} = \boxed{125x^9}$ Negative Exponent Rule & Law #2 - Product Rule

15. $\frac{12x^5y^7}{4x^3y^2}$

$3 \cdot x^{5-3} \cdot y^{7-2} = \boxed{3x^2y^5}$ Law # 3 - Quotient Rule

Multiply

16. $3a^3(5a^5 - 4)$ $\boxed{15a^8 - 12a^3}$ Distribution

17. $(a+b)^2$ $= (a+b)(a+b)$

$= a^2 + ab + ab + b^2$

$= \boxed{a^2 + 2ab + b^2}$