

Fall, 2007– Olson READ DIRECTIONS CAREFULLY. NAME: _____

First

Last

Total is out of 100 pts. EQUIPMENT: **pencil, eraser, color pencils, ruler, calculator**. Show all work on the paper here. Step DOWN between steps. (Keep exact answers.) Circle the final answer on multi-step (non-graph) problems. IF more space is needed to *finish* a problem, say “see back” and put just the *finish* on the back of another page. Little credit will be given for unsupported answers. (Projected time needed is \approx 50 minutes.) Good Luck **J**, remember good test-taking strategies, and to breathe.

(5 pts ea) True or false. Show reasoning in either case. (No reasoning, no credit.)

1) $3^{-4} = -3^4$

2) $(x - 5)^2 = x^2 + 25$

(5 pts) Solve. Check.

3) $2 - 4(x - 2) = 3x + 5$

(5 pts) Applications: To receive full credit, show the full flow-chart process: i) Read, ii) Assign; iii) Verbal; iv) Equation. v) Solve. vi) Interpret & Write: a) Makes-sense?-check b) English (write the final answer in a complete sentence). Leave answers exact unless otherwise directed or natural in the problem circumstances.

- 4) A Piper Cub airplane has an average air speed that is 10 mph faster than a Cessna 150 airplane. If the combined distance traveled by these two small airplanes is 690 miles after 3 hr, what is the average speed of each plane?

(5 pts) Graph the equation (in two dimensions on the graph paper provided).

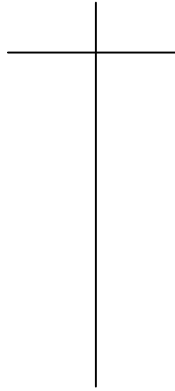
Do all the following as part of this process for maximum credit:

Find *all* intercepts. Find at least three ordered pairs in all for each non-horizontal/non-vertical line.

Put all ordered pairs found in the t-table *here*.

Label appropriately: axes, scale (at outer ends), intercepts as ordered pairs - as seen in class.

5) $3x - 5y = -15$



6) (4 pts) Complete these laws of exponents.

a) $a^{-n} =$

b) $\frac{a^m}{a^n} =$

(10 pts ea) Simplify. Write using positive exponents only.

7) $\left(\frac{5x}{x^6}\right)^3$

8) $(-4xy^{-4}z)^{-3}$

9) $(2x^{-4})(-4x^4)$

10) (2 pts) Evaluate the following expression (if possible).

$$\sqrt[3]{-27}$$

11) (6 pts) Use the product and quotient rules of radicals to simplify the expression.

$$\sqrt{\frac{8a^2}{5}}$$

12) (3 pts) Perform the following operation without a calculator. Show work. Leave the answer in scientific notation.

$$\frac{8.6 \times 10^5}{2.0 \times 10^{-3}}$$

13) (6 pts)				
Use this polynomial to complete the table. For each row, write:	$25xy - x^3y$			
The separate terms (one per box <i>as needed</i> , there may be extra boxes)				
The coefficient of each term (one per box as needed)				
The degree of each term (one per box as needed)				
The polynomial in descending order by x 's				
The degree of the polynomial				
The leading coefficient of the polynomial				
Circle which one of these applies. This polynomial is also:	A monomial	A binomial	A trinomial	None of these

(6 pts each) Perform the indicated operations. Write any long division remainder as a fraction.

14) $(-3x^3y + 6x^2y^2) - (5x^3y - 5x^2y^2 + 10xy)$

16) $(2x + 3)(8x^2 - 6x + 9)$

15) $\left(a + \frac{2}{3}\right)\left(a - \frac{2}{3}\right)$

17) $\frac{4x^3 - 16x + 2}{4x - 8}$

18) (2 pts) Matching. Complete the following statements using the words/phrases in the list. **Write just the letter** for the appropriate phrase in each blank. Some words may not be used, and some may be used more than once. Some sentences require more than one response.

- | | | |
|---------------------------|---------------------------------------|---------------|
| a) base | j) exponent | s) opposite |
| b) binomial | k) “first, outer, inner, last” | t) polynomial |
| c) coefficient | l) F. O. I. L. | u) quotient |
| d) degree of a term | m) index | v) radical |
| e) degree of a polynomial | n) like terms | w) radicand |
| f) descending order | o) linear | x) reciprocal |
| g) distribute | p) long | y) remainder |
| h) dividend | q) monomial | z) term |
| i) divisor | r) “the n^{th} root of a ” | aa) trinomial |

I. A polynomial which has three terms is called a _____.

II. For the long division process (see figure below), you can check your answer by the following process:

multiply the _____ by the _____, then add the _____ to that. If correct, that result should equal the _____.

$$\begin{array}{r}
 \text{quotient} \\
 \text{divisor} \overline{) \text{dividend}} \\
 \text{-----} \\
 \text{remainder}
 \end{array}$$

III. The expression $\sqrt[n]{a}$ is read _____, where n is the _____, $\sqrt{\quad}$ is the _____, and a is the _____.

IV. In the expression a^n , a is called the _____ and n is called the _____.

V. Terms which have the same variables all raised to the same powers are called _____.

VI. A _____ is a term or sum of terms having whole number exponents on any variable.

VII. The _____ of a term is its numerical factor.

VIII. To multiply two polynomials, we _____ the first polynomial over the second. A shortcut we can use for this when it's two binomials is _____ which stands for multiplying each in this specific order: _____.

IX. When dividing any polynomial by a binomial, we must use _____ division.

X. The negative in an expression with a negative exponent (e.g., a^{-n}) means take the _____ and make the exponent positive.

XI. A polynomial which has one term is called a _____.