

Name: \_\_\_\_\_

Place your answers in the spaces provided. You must show correct work to receive credit.(8 pts) 1. Evaluate the following expression for  $a = -3$  and  $b = 4$ :

$$10(2a + b) \div (a^2 - b) + |6a|$$

$$10(2(-3) + 4) \div ((-3)^2 - 4) + |6(-3)|$$

$$= 10(-6 + 4) \div (9 - 4) + |-18|$$

$$= 10(-2) \div 5 + 18$$

$$= -20 \div 5 + 18$$

$$= -4 + 18 = 14$$

14
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(6 pts) 2. Multiply and express your answer in scientific notation.

$$(8.2 \times 10^{-25})(2.5 \times 10^{11})$$

$$= 20.5 \times 10^{-25+11}$$

$$= 20.5 \times 10^{-14}$$

$$= 2.05 \times 10^1 \times 10^{-14}$$

$$= 2.05 \times 10^{-13}$$

$2.05 \times 10^{-13}$
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(8 pts) 3. Perform the indicated operations and simplify. Do not use a calculator. Express your answer as a fraction in lowest terms.

$$\frac{4}{5} - \frac{2}{3} \div \frac{8}{25}$$

$$= \frac{12}{15} - \frac{10}{15} \div \frac{8}{25}$$

$$= \frac{2}{15} \times \frac{25}{8}$$

$$= \frac{1}{3} \times \frac{5}{4} = \frac{5}{12}$$

$\frac{5}{12}$
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- (10 pts) 4. Shane is going to invest \$4200 at a simple interest rate of 8.5%. Use the formula,  $A = P + Prt$  to find how long it will take for the investment to be worth \$6300. Round your answer to one decimal place.

$$4200 + (4200)(.085)(t) = 6300$$

$$4200 + 357t = 6300$$

$$357t = 2100$$

$$t = 5.9$$

5.9 years

- (8 pts) 5. Solve  $W = \frac{2c + d}{4}$  for  $c$ .

$$4W = 2c + d$$

$$4W - d = 2c$$

$$\frac{4W - d}{2} = c$$

$$c = \frac{4W - d}{2} \text{ or } 2W - \frac{d}{2}$$

- (8 pts) 6. Simplify.

$$4x - [3 - 2(5x + 6)] + 2x - 6$$

$$4x - [3 - 10x - 12] + 2x - 6$$

$$= 4x - (-10x - 9) + 2x - 6$$

$$= 4x + 10x + 9 + 2x - 6$$

$$= 16x + 3$$

16x + 3

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Place your answers in the spaces provided. You must show correct work to receive credit.(12 pts) 7. Solve the following equations for  $x$ .

(6 pts) (a)  $11x = \frac{1}{4}(24 + 4x)$

$$11x = 6 + x$$

$$10x = 6$$

$$x = \frac{6}{10}$$

$$x = \frac{6}{10} \text{ or } \frac{3}{5} \text{ or } .6$$

(6 pts) (b)  $3(2x - 1) = 5(x + 2)$

$$6x - 3 = 5x + 10$$

$$x = 13$$

$$x = 13$$

(20 pts) 8. Simplify completely. Do not leave negative exponents in your answer.

(6 pts) (a)  $(6x^{-12}y^5)(-2x^8y^2)$

$$= -12x^{-12+8}y^{5+2}$$

$$= -12x^{-4}y^7$$

$$-\frac{12y^7}{x^4}$$

(6 pts) (b)  $(3a^4b^{-3})^{-3}$

$$= 3^{-3}a^{-12}b^9$$

$$= \frac{b^9}{3^3a^{12}}$$

$$\frac{b^9}{27a^{12}}$$

(8 pts) (c)  $\frac{5x^0x^{-9}y^{-4}z^3}{25x^{-7}y^3z^{12}}$

$$= \frac{5x^7z^3}{25x^9y^3y^4z^{12}}$$

$$= \frac{1}{5x^2y^7z^9}$$

$$\frac{1}{5x^2y^7z^9}$$

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Place your answers in the spaces provided. You must show correct work to receive credit.

- (8 pts) 9. Translate the following expression into a mathematical equation. DO NOT SOLVE THE EQUATION: A boat travels at a rate of 23 km/h in still water. It is traveling in a river that has a current of 8 km/h. How long would it take the boat to travel 75 km downstream. (Name a variable and set up an equation)

let  $t$ =time for boat to travel 75 km downstream

	r	t	d
downstream	23+8	t	75

(rate)(time)=distance

$$(23 + 8)t = 75$$

$$(23 + 8)t = 75 \text{ or } 31t = 75$$

- (12 pts) 10. A piece of wire 15 meters long is cut into three pieces. The second piece is  $\frac{1}{3}$  as long as the first piece, while the third piece is 4 meters longer than the second piece. Find the length of each piece. (Name a variable, set up an equation, and solve.)

let  $x$ =length of the first piecethen  $\frac{1}{3}x$  = length of the second pieceand  $\frac{1}{3}x + 4$  = length of third piece

$$x + \frac{1}{3}x + \frac{1}{3}x + 4 = 15$$

$$x + \frac{2}{3}x = 11$$

$$\frac{5}{3}x = 11$$

$$x = (11) \frac{3}{5} = \frac{33}{5}$$

length of first piece = 

6.6 m

length of second piece = 

2.2 m

length of third piece = 

6.2 m

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