

Math 40 – Elementary Algebra

AMBER BUNTIN • FALL 2015

Exam#3

Print Name: _____ Date: 12.1.15

Important Instructions - Please READ CAREFULLY!

- ✓ You have 50 minutes to complete the exam. Please read ALL instructions carefully;
- ✓ You may NOT use a calculator;
- ✓ Use **proper mathematical notation** on ALL problems
- ✓ You may NOT use any notes, book, or neighbors during the exam;
- ✓ Use only pencil and indicate answers by **BOXING**, **CIRCLING**, or **HIGHLIGHTING**;
- ✓ Be sure to show your work **NEATLY** and **CLEANLY** for each problem;
- ✓ You must show work to receive full credit and simplify all answers completely;
- ✓ Leave fractions as improper fractions if necessary (no mixed numbers);

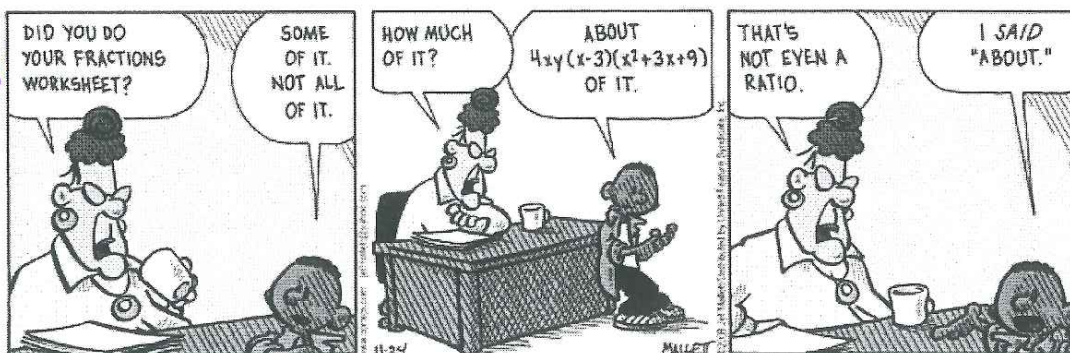
By signing below, I am verifying that I have read the above guidelines and agree to follow them. Also, all of the work contained on this exam is my own and I promise to adhere to academic honesty.

Print Name: Key

Signature: _____

Ave: 68.3%^D

A	3
B	4
C	7
D	14



Exam#3: (100 points) Show your work and clearly mark your answer **use proper mathematical notation**. No calculators allowed. Leave answers as reduced fractions if needed (NO mixed numbers). You are NOT allowed to get help on this Exam.

- (5pts) 1. Identify the base and the exponent of the following expressions. Do NOT simplify.

a) $(-2x)^6$

Base: $-2x$ Exponent: 6

*3/5 are wrong
2/5 both wrong*

b) $-6b^5$

Base: b Exponent: 5

- (20pts) 2. Simplify the following expressions completely and leave all answers with POSITIVE exponents only.

4 a) $\frac{x^{\frac{4}{3}}x^{\frac{8}{3}}}{x^4} = \frac{x^{\frac{4}{3}+\frac{8}{3}}}{x^4} = \frac{x^{\frac{12}{3}}}{x^4} = \frac{x^4}{x^4} = x^0 = 1$

+2.5 *+2.5/4 good effort*

4 b) $(-3x^8y^6z)(2x^5yz^2)^2$

$= -3x^8y^6z(4x^{10}y^2z^4) = -12x^{18}y^8z^5$

2 c) $\left(\frac{26x^2y^2}{13y^{-4}}\right)^0 = 1$

$(\text{Anything})^0 = 1$ Anything $\neq 0$

5 d) $\frac{(x^{-2})^3(x^4)^2}{(x^{-3})^{-2}} = \frac{x^{-6}x^8}{x^6} = \frac{x^{-6+8}}{x^6} = \frac{x^2}{x^6} = \frac{1}{x^4}$

x^4 +3/5

5 e) $\left(\frac{26x^4y^6}{39xy^4}\right)^2 = \left(\frac{2x^{4-1}y^{6-4}}{3}\right)^2 = \left(\frac{2x^3y^2}{3}\right)^2 = \frac{4x^6y^4}{9}$

+3 good effort

$\frac{26}{2 \cdot 13} \quad \frac{39}{3 \cdot 13}$

$\frac{26}{39} \times \frac{6y^4}{3 \cdot 5} = \frac{2}{3} \times \frac{2y^4}{5} = \frac{4y^4}{15}$

25

- (5pts) 3. Expand each number from scientific notation to expanded form. Re-write final number nice and clean with ONLY one decimal point in final answer.

a) $-4.3296 \times 10^8 = -4,32960000$
 $= -432,960,000$

b) 2.36×10^{-5}

$\overline{0.0000236}$
 $= 0.0000236$

- (5pts) 4. Write each number using scientific notation.

a) $1,936,000 = 1.936 \times 10^6$

b) $0.0000478 = 4.78 \times 10^{-5}$

+2 2 wrong

+3 1 wrong
 +2.5 -4.5
 small
 mistake!

- (10pts) 5. Perform the following operations and simplify completely. Show work if multiple steps are needed.

2 a) Subtract: $(7r^2 - 5rs + 2s^2) - (6s^2 - 3r^2 - 4rs)$

$= 7r^2 - 5rs + 2s^2 - 6s^2 + 3r^2 + 4rs$
 $= 10r^2 - rs - 4s^2$

2 b) Multiply: $(-2x + 5y)(7x - 5y)$ FOIL

$= -14x^2 + 10xy + 35xy - 25y^2$
 $= -14x^2 + 45xy - 25y^2$

6.5/2
 $-14x^2 - 25y^2$

3 c) Multiply: $(7w - 9)^2$

$= (7w - 9)(7w - 9)$
 $= 49w^2 - 63w - 63w + 81$
 $= 49w^2 - 126w + 81$

OR Formula $(a - b)^2 = a^2 - 2ab + b^2$
 $(7w - 9)^2$
 $= (7w)^2 - 2(7w)(9) + (9)^2$
 $= 49w^2 - 126w + 81$

$49w^2 + 81$
 $+ 1.5/3$

3 d) Multiply: $(2r - 5)(-10r^2 + 5r + 6)$

$= -20r^3 + 10r^2 + 12r$
 $+ 50r^2 - 25r - 30$
 $= -20r^3 + 60r^2 - 13r - 30$

- (10pts) 6. Divide the polynomials using LONG DIVISION. Answer in the correct format if there is a remainder.

$$\frac{15x^2 + 19x - 4}{3x + 8}$$

$$= 5x - 7 + \frac{52}{3x+8}$$

$$\begin{array}{r} 5x - 7 \\ 3x+8 \overline{) 15x^2 + 19x - 4} \\ \underline{-15x^2 + 40x} \\ -21x - 4 \\ \underline{+21x + 56} \\ 52 \end{array}$$

$$5x+7 + \frac{52}{3x+8}$$

Remainder
 $\frac{52}{5x-7} + 8/10$

7/10 bon

- (10pts) 7. Factor the polynomials completely. Show some steps and if you are guessing and checking, show check. Also, always remember, the first two rules of factoring....

2 a) $5xy^3 - 35x^3y^5 + 15x^2y^4$ GCF ONLY here!

$$5xy^3(1 - 7x^2y^2 + 3xy)$$

+1/2
 Not whole
 GCF
 or
 No placeholder
 1

3 b) $x^2 + ax + 2x + 2a \leftarrow 4 \text{ terms} \Rightarrow \text{Factor by grouping!}$

$$= x(x+a) + 2(x+a)$$

$$= (x+a)(x+2)$$

5 c) $16x^3y - 24x^2y + 28xy - 42y$ 2 rules! ① Descending order

$$= 2y(8x^3 - 12x^2 + 14x - 21)^{+2}$$

② GCF? (overall)

$$= 2y[4x^2(2x-3) + 7(2x-3)] \leftarrow 4 \text{ terms} \Rightarrow \text{Group!}$$

$$= 2y(2x-3)(4x^2+7)$$

$$(4x+6)(4x^2y+7y)$$

$$+3.5/5$$

$$/20$$

- (20pts) 8. Factor the polynomials completely. Show some steps and if you are guessing and checking, SHOW CHECK!!!

5 a) $x^2 + 13x - 30$ $\rightarrow -1$

$$= x^2 + 15x - 2x - 30$$

$$= x(x+15) - 2(x+15)$$

$$= \boxed{(x+15)(x-2)}$$

Use ac method!

$$\begin{array}{r} -30 \\ 15 \times -2 \\ 13 \end{array}$$

$$(x+15)(x+2) + 4/5$$

$$(x-10)(x-3) + 3/5$$

5 b) $-5n + n^2 - 6$

$$= n^2 - 5n - 6$$

$$= n^2 - 6n + 1n - 6$$

$$= n(n-6) + 1(n-6)$$

$$= \boxed{(n-6)(n+1)}$$

$$\begin{array}{r} -6 \\ -6 \times 1 \\ -5 \end{array}$$

+2 effort

Same !!
0

5 c) $2r^4 + 26r^3 - 60r^2$

$$= 2r^2(r^2 + 13r - 30)$$

$$= \boxed{2r^2(r+15)(r-2)}$$

$$\begin{array}{r} -30 \\ 15 \times -2 \\ 13 \end{array}$$

No GCF
4/5

5 d) $x^2 - 11xy + 24y^2$

$$= x^2 - 8xy - 3xy + 24y^2$$

$$= x(x-8y) - 3y(x-8y)$$

$$= \boxed{(x-8y)(x-3y)}$$

$$\begin{array}{r} 24 \\ -8 \times -3 \\ -11 \end{array}$$

No y's
+3.5/5
(x-8)(x-3)

- (15pts) 9. FACTOR the polynomials completely USING THE AC METHOD or another approved method from class. Show some steps either way and if you are guessing and checking, show check. Use proper notation and show "side work" off to the side.

5 a) $-15 + 2x^2 - 13x$

$$= 2x^2 - 13x - 15$$

$$= 2x^2 - 15x + 2x - 15$$

$$= x(2x - 15) + 1(2x - 15)$$

$$= \boxed{(2x - 15)(x + 1)}$$

$$\begin{array}{r} -30 \\ -15 \times 2 \\ -13 \end{array}$$

5 b) $10x^3 - 7x^2 - 12x$

$$= x(10x^2 - 7x - 12)$$

$$= x[10x^2 + 8x - 15x - 12]$$

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

$$= \boxed{x(5x + 4)(2x - 3)}$$

$$\begin{array}{r} a.c \\ 10(-12) \\ -120 \\ 8 \times -15 \\ -7 \end{array}$$

$$\begin{array}{r} 120 \\ 1 \mid 120 \\ 2 \mid 60 \\ 3 \mid 40 \\ 4 \mid 30 \\ 5 \mid 24 \\ 6 \mid 20 \\ 8 \mid 15 \end{array}$$

5 c) $-8x^3 + 10x - 16x^2$

$$= -8x^3 - 16x^2 + 10x$$

$$= -2x(4x^2 + 8x - 5)$$

$$= -2x[4x^2 + 10x - 2x - 5]$$

$$= -2x[2x(2x + 5) - 1(2x + 5)]$$

more!
+1

$$= \boxed{-2x(2x + 5)(2x - 1)}$$

$$\begin{array}{r} -20 \\ 10 \times -2 \\ 8 \end{array}$$

- (3pts) 10. Extra Credit. Factor the polynomial completely. Show multiple steps and use proper notation. This problem will be graded either correct or incorrect and NO partial credit will be given.

$$35x^3z^2 - 60x^2z^3 - 20xz^4$$

$$= 5xz^2(7x^2 - 12xz - 4z^2)$$

$$= 5xz^2[7x^2 - 14xz + 2xz - 4z^2]$$

$$= 5xz^2[7x(x - 2z) + 2z(x - 2z)]$$

$$= \boxed{5xz^2(x - 2z)(7x + 2z)}$$

$$\begin{array}{r} -28 \\ -14 \times 2 \\ -12 \end{array}$$

$$\begin{array}{r} -28 \\ 1 \mid -28 \\ 2 \mid -14 \end{array}$$

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