MAT 011, Exam #3 Review

Name KEY

1. Simplify each expression. Write with positive exponents only.

a. $(-3)^6$ 729

b. $(-2z^3)(-2z^2)$ $4z^5$

c. $\left(\frac{mp}{n}\right)^5$ $\frac{m^5p^5}{n^5}$

d. $(4y)^0$ 1

e. $(4ab)^3$ $64a^3b^3$

f. $(7x)^{-3}$ $\frac{1}{343y^3}$

g. $\frac{(y^4)^2}{y^{12}}$ $\frac{y^8}{y^{12}} = \frac{1}{y^4}$

h. $\frac{(a^6b^{-2})^4}{(4a^{-3}b^{-3})^3}$ $\frac{a^{24}b^{-8}}{64a^{-9}b^{-9}} = \frac{a^{33}b}{64}$

i. $7 \cdot 2^5$ $7 \cdot 25 = 175$

j. $(-7a^3b^3)(7a^{19}b)$ $-49a^{22}b^4$

k. $(4x^6)^2$ $16x^{12}$

l. $4y^0$ 4

m. $\left(\frac{\cancel{3}y^5}{\cancel{6}_{2}x^4}\right)^3$ $\frac{y^{15}}{8x^{12}}$

n. $\left(-\frac{1}{8}\right)^{-2}$ 64

o. $\frac{3^{-1}x^4}{3^3x^{-7}}$ $\frac{x^{11}}{81}$

p. $\frac{(a^4b^{-7})^{-5}}{(5a^2b^{-1})^{-2}}$ $\frac{a^{-20}b^{35}}{5^{-2}a^{-4}b^2} = \frac{25b^{33}}{a^{16}}$

q. -2^4 -16

r. $(2a^5)^3$ $8a^{15}$

s. $\frac{p^7q^{20}}{pq^{15}}$ p^6q^5

t. $a^3a^2a^4$ a^9

u. $\frac{(4x^3y^6z)^2}{18x^4y}$ $\frac{\cancel{16}^{\,8}x^6y^{12}z^2}{\cancel{18}_{\,9}x^4y} = \frac{8x^2y^{11}z^2}{9}$

v. $\frac{y}{y^{-3}}$ y^4

w. $\left(\frac{a^{-5}b}{ab^3}\right)^{-4}$ $\frac{a^{20}b^{-4}}{a^{-4}b^{-12}} = a^{24}b^8$

2. State the degree of each polynomial. Is it a monomial, binomial, trinomial, or none of these?

a. $3.9x^2 - 3.6x$ degree 2 binomial

b. $10x^3y^2 - 3x^2y^2 + 2y^2$ degree 5, trinomial

c. $3a^3 - b + 2a - 5$ degree 3, none of these

d. $-11x$ degree 1, monomial

e. 5 degree 0, monomial

f. $\frac{2}{3}x^4 + 6$ degree 4, binomial

g. $6x^3y - 4 - 5y$ degree 4, trinomial

h. $7x + 3x^3 + 2x^2 - 1$ degree 3, none of these

3. Perform the indicated operation. Simplify.

a. $12k^3 - 9k^3 + 11$ $3k^3 + 11$

b. $\frac{1}{6}x^4 - \frac{1}{7}x^2 + 5 - \frac{1}{2}x^4 - \frac{3}{7}x^2 + \frac{1}{3}$ $-\frac{1}{3}x^4 - \frac{4}{7}x^2 - \frac{1}{6}$

c. $(2x^2 + 3x - 9) - (-4x + 7)$ $2x^2 + 7x - 16$

d. $(6y^5 - 6y^3 + 4) + (-2y^5 - 8y^3 - 7)$ $4y^5 - 14y^3 - 3$

e. $(a^2 - ab + 4b^2) + (6a^2 + 8ab - b^2)$ $7a^2 + 7ab + 3b^3$

f. $(4x^2 + y^2 + 3) - (x^2 + y^2 - 2)$ $3x^2 + 5$

g. $-2a^2(3a^2 - 2a + 3)$ $\quad -6a^4 + 4a^3 - 6a^2$

h. $2x(6x + 3)$ $\quad 12x^2 + 6x$

i. $(a + 7)(a - 2)$ $\quad a^2 - 2a + 7a - 14 = a^2 + 5a - 14$

j. $(3x^2 + 1)(4x^2 + 7)$ $\quad 12x^4 + 21x^2 + 4x^2 + 7 = 12x^4 + 25x^2 + 7$

k. $(6x - 7)^2$ $\quad 36x^2 - 84x + 49$

l. $(3x^2 + 1)^2$ $\quad 9x^4 + 6x^2 + 1$

m. $(a + 2)(a^3 - 3a^2 + 7)$ $\quad a^4 - 3a^3 + 7a + 2a^3 - 6a^2 + 14 = a^4 - a^3 - 6a^2 + 7a + 14$

n. $(y - 2)^3$ $\quad y^3 - 6y^2 + 12y - 8$

o. $(5x + 1)(2x^2 + 4x - 1)$ $\quad 10x^3 + 20x^2 - 5x + 2x^2 + 4x - 1 = 10x^3 + 22x^2 - x - 1$

p. $(4x - 5)(4x + 5)$ $\quad 16x^2 - 25$

q. $(5b - 4x)^2$ $\quad 25b^2 - 40bx + 16x^2$

r. $(5x - 6z)(5x + 6z)$ $\quad 25x^2 - 36z^2$

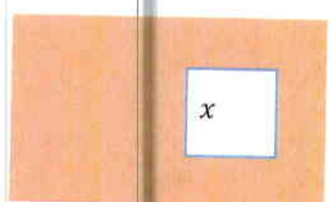
4. Find the area.

a. $2x - 7$ $\quad x + 11$

$(2x - 7)(x + 11) = 2x^2 + 22x - 7x - 77$

$= 2x^2 + 15x - 77$

b. $x + 5$ $\quad 3x + 1$

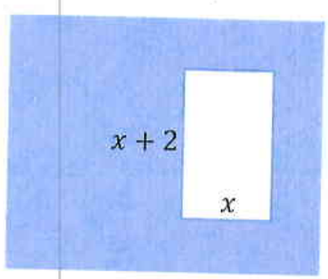


$(3x + 1)(x + 5) - x^2$

$3x^2 + 15x + x + 5 - x^2$

$2x^2 + 16x + 5$

c. $3x + 7$ $\quad 5x - 1$



$(5x - 1)(3x + 7) - x(x + 2)$

$15x^2 + 35x - 3x - 7 - (x^2 + 2x)$

$14x^2 + 30x - 7$

5. Complete the Table.

	Standard Notation	Scientific Notation
a.	0.0000048	4.8×10^{-6}
b.	5,000,000	5×10^{6}
c.	11,000,000,000,000	1.1×10^{13}
d.	0.000036	3.6×10^{-5}
e.	125,353,800	$(26.785 \times 10^{-4})(4.68 \times 10^{10})$
f.	0.000002	$\frac{0.4 \times 10^{5}}{0.2 \times 10^{11}}$

6. Divide. Use long division when the denominator has more than one term. Write any remainder as $\frac{Remainder}{Divisor}$.

a. $\frac{15p^3+18p^2}{3p}$

$5p^2 + 6p$

b. $\frac{2x^2+13x+15}{x+5}$

$x + 8 - \frac{25}{x+5}$

$x+5 \overline{)\, 2x^2+13x+15}$

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

$8x+15$

$-(8x+40)$

-25

c. $\frac{x^3+64}{x+4}$

x^2-4x+4

$x+4 \overline{)\, x^3+0x^2+0x+64}$

$-(x^3+4x^2)$

$-4x^2+0x$

$-(-4x^2-16x)$

$16x+64$

$-(16x+64)$

0

d. $\frac{4x^4-6x^3+7}{-4x^4}$

$-1 + \frac{3}{2x} - \frac{7}{4x^4}$

e. $\frac{9a^3-3a^2-3a+4}{3a+2}$

$3a^2-3a+1+\frac{2}{3a+2}$

$3a+2 \overline{)\, 9a^3-3a^2-3a+4}$

$-(9a^3+6a^2)$

$-9a^2-3a$

$-(-9a^2-6a)$

$3a+4$

$-(3a+2)$

2

f. $\frac{3x^3+11x+12}{x+4}$

$3x^2-4x+27$

$x+4 \overline{)\, 3x^3+0x^2+11x+12}$

$-(3x^3+12x^2)$

$-12x^2+11x$

$-(-12x^2-16x)$

$27x+12$

$-(27x+108)$

-96

$3x^2-4x+27-\frac{96}{x+4}$