Math 10C Review
To be completed before starting Math 20-1

1. Identify the error in each of the following and show a correct solution.

a. $\frac{1}{2}+\frac{2}{3}=\frac{3}{6}+\frac{4}{6}$

$=\frac{3+4}{6+6}$

$=\frac{7}{12}$

b. $-5\frac{1}{4}+2\frac{1}{8}=-\frac{19}{4}+\frac{17}{8}$

$=-\frac{38}{8}+\frac{17}{8}$

$=-\frac{21}{8}$

2. Add or subtract the following fractions by getting a common denominator. Show all steps of work. Express all answers in simplest ***improper*** form.

a. $\frac{2}{3}+\frac{4}{5}$

b. $\frac{1}{2}-\frac{1}{3}$

c. $3\frac{2}{3}+2\frac{1}{2}$

d. $\frac{5}{12}-\frac{1}{3}$

e. $5\frac{1}{4}-2\frac{5}{6}$

f. $\frac{3}{8}+\frac{3}{4}-\frac{5}{6}$

g. $\frac{4}{5}-\frac{2}{3}+\frac{1}{4}$

h. $6-\frac{2}{3}$

i. $\frac{9}{5}-1$

3. Multiply or divide the following fractions. Express in simplest *improper* form.

a. $\frac{2}{7} \times \frac{3}{4}$

b. $\left(\frac{1}{5}\right)\left(\frac{12}{13}\right)$

c. $\left(\frac{3}{8}\right)\left(\frac{4}{5}\right)$

d. $\left(2\frac{1}{6}\right)\left(\frac{3}{5}\right)$

e. $\left(1\frac{1}{4}\right)\left(5\frac{2}{3}\right)$

f. $\left(-1\frac{5}{7}\right)\left(-2\frac{1}{2}\right)$

g. $\frac{3}{4} \div \frac{1}{2}$

h. $\frac{3}{8} \div \frac{4}{5}$

i. $-\frac{5}{6} \div \frac{3}{4}$

j. $3\frac{1}{8} \div \frac{3}{4}$

k. $-2\frac{1}{2} \div 1\frac{5}{6}$

l. $3\frac{1}{4} \div \frac{-1}{2}$

4. Convert the following radicals to ***simplest mixed*** radical form.

a. $\sqrt{50}$

b. $\sqrt{12}$

c. $\sqrt{60}$

d. $4\sqrt{45}$

e. $\sqrt{21}$

f. $2\sqrt{48}$

g. $\sqrt[3]{32}$ h. $5\sqrt[3]{250}$ i. $6\sqrt[3]{108}$

j. $\sqrt{99x^3}$ k. $\sqrt{600a}$ l. $\sqrt[3]{162}$

m. $2\sqrt{20}$ n. $-1\sqrt[3]{16}$ o. $\sqrt{700x^2y}$

5. Complete the following chart by converting between radical and exponential form.

Radical Form	Exponent Form
$\sqrt[5]{3^2}$	
	$x^{\frac{1}{2}}$
$5\sqrt{ac}^3$	
	$(xy)^{\frac{3}{4}}$
$\sqrt[3]{6}$	
	$4y^{\frac{3}{2}}$

6. Fully simplify the following exponential expressions using the laws of exponents. Express final answers using positive exponents only.

a. $(3xy)(4x^5y^2)$

b. $\left(\frac{p^{-7}q^2}{p^2q^{-8}}\right)^2$

c. $(a^{-2}b)^{-3}(ab^{-7})$

d. $\left(\frac{-6u^{-5}v^2}{-2u^4v^3}\right)^2$

e. $(-8m^{-3}n^2)(2m^5n)^3$

f. $\left(\frac{-9mn^{-3}}{3m^4n^{-5}}\right)^2$

g. $\frac{(5r^{-2})(2r^{-6})}{7r^5}$

h. $\left(\frac{-3x^2y^3}{x^{-4}y^2}\right)(-2x^{-8}y^{-2})$

i. $(s^4t^2)^3(s^{-5}t^3)^2$

j. $(-8r^3s^{-5})\left(\frac{r^7s^{-5}}{2r^{-4}s^7}\right)$

k. $\left(\frac{-4b^{-2}c^3}{-8b^4c^{-7}}\right)^{-3}$

l. $(-5a^2b^4)(2bc^{-3})^2(-3c^4)^3$

7. These problems have some of the most common mistakes that students make with exponents. ***Three*** of these problems are correct. Circle the correct ones & explain ***and*** correct the mistake in the ones with errors.

a) $(x^3y^4)(x^3y^4) = 2x^3y^4$

b) $(3m^3)(2m^5) = 5m^8$

c) $(6a^3b)(2a^3b^4) = 12a^6b^4$

d) $(4p^2q^4)(p^2q) = 4p^4q^5$

e) $(5f^3)(7f^5) = 35f^{15}$

f) $(x^3y)^2 = x^5y^2$

g) $(m^2)^3 = m^{2^3} = m^8$

h) $(3m^3)^3 = 27m^9$

i) $(4g^2)(g^5) = 16g^5$

j) $(5x^7y^4)^5 = 5x^{35}y^{20}$

k) $(3a^4b^2)^3 = 9a^{12}b^6$

l) $(-m^2n)(2m^5n^4) = m^3n^3$

m) $(-m^2)(2m^5n^4) = 2m^7n^4$

n) $3x(4x^2y)^2 = (12x^3y)^2 = 144x^6y^2$

o) $w^4(3w^2 + 2w - 1) = 3w^6 + 2w - 1$

p) $5xy^3(5x - y) = 25x^2y^3 - 5xy^4$

q) $3x^2(x^4 + 3x^2 + 2) = 3x^6 + 9x^4 + 6x^2 = 18x^{12}$

r) $5a^2b(3a^2 + 2b^3) = 8a^4b + 7ab^4$

8. Kristine was solving some linear equations. Her work is shown below. Each solution is ***incorrect***. Identify the error & provide a correct solution.

a)

$8 - 5c = -37$

$-8 \quad -8$

$\frac{5c}{5} = \frac{-45}{5}$

$c = -9$

b)

$4x - 3 = 17$

$+3 \quad +3$

$4x = 20$

$-4 \quad -4$

$x = 16$

9. Solve the following equations algebraically. Show all your work.

a) $-20 = -4x - 6x$

b) $6 = 1 - 2n + 5$

c) $8x - 2 = -9 + 7x$

d) $a + 5 = -5a + 5$

e) $4m - 4 = 4m$

f) $p - 1 = 5p + 3p - 8$

g) $5p - 14 = 8p + 4$

h) $p - 4 = -9 + p$

i) $-8 = -(x + 4)$

j) $12 = -4(-6x - 3)$

k) $14 = -(p - 8)$

l) $-(7 - 4x) = 9$

m) $-18 - 6k = 6(1 + 3k)$

n) $5n + 34 = -2(1- 7n)$

o) $2(4x - 3) - 8 = 4 + 2x$

p) $3n - 5 = -8(6 + 5n)$

q) $-(1 + 7x) - 6(-7 - x) = 36$

r) $24a - 22 = -4(1 - 6a)$

s) $-3(4x + 3) + 4(6x + 1) = 43$

t) $-5(1 - 5x) + 5(-8x - 2) = -4x - 8x$

10. ***Completely factor*** the following polynomials.

a) $2x^2 + 3x - 9$

b) $5x^2 + 19x + 12$

c) $2w^2 + 7w + 5$

d) $2p^2 + 11p + 5$

e) $3v^2 - 8v + 4$

f) $3x^2 - 2x - 5$

g) $25n^2 - 1$

h) $9m^2 + 66m + 21$

i) $7q^2 + 53q + 28$

j) $2x^2 - 18$

k) $15n^2 - 27n - 6$

l) $5r^2 - 18r + 9$

m) $4n^2 - 15n - 25$

n) $4c^2 - 35c + 49$

o) $4x^2 - 17x + 4$

p) $6y^2 + 7y - 49$

q) $6k^2 + 37k + 6$

r) $-6m^2 - 25m - 25$

11. Solve the following systems of equations algebraically by using either the elimination method or the substitution method.

a) $y = -3x + 4$
$y = 3x - 2$

b) $y = x + 2$
$x = -3$

c) $x - y = 3$
$7x - y = -3$

d) $4x + y = 2$
$x - y = 3$

e) $y = 4x - 9$
$y = x - 3$

f) $4x + 2y = 10$
$x - y = 13$

g) $6x + 8y = -22$
$y = -5$

h) $-7x + 2y = 18$
$6x + 6y = 0$

i) $-7x - 24 = -4y$
$4x = 4y$

j) $x + 7y = 0$
$2x = 22 + 8y$

k) $4x = 20 + y$
$0 = 2x + 2y + 10$

l) $20 + 8x = 6y$
$7y = 16x + 30$

12. Mrs. Properzi was trying to solve the system of equations shown below by using the substitution method but she made an error. Find and correct her mistake.

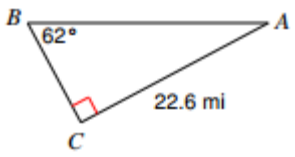
$-3x+5y=17$ Solution: $\left(\frac{17}{3}, \frac{31}{6}\right)$ $2x-8y=-30$ $-3x+5y=17$ $2x-8y=-30 \rightarrow x=\frac{8y-30}{2}=4y-15$ $-3(4y-15)=17$ $-12y-45=17$ $-12y=62$ $y=\frac{31}{6}$ $x=4\left(\frac{31}{6}\right)-15=\frac{62}{3}-\frac{45}{3}=\frac{17}{3}$	Description of Error: Correct Solution:

13. Katherine was solving the system of equations shown below but made a terrible mistake. Find & correct the error.

$7x-2y=24$ $-x+y=-2$ Solution: dependent system, infinite number of solutions $7x-2y=24$ $-x+y=-2 \quad \rightarrow \quad \underline{y=x-2}$ $-x+(x-2)=-2$ $-2=-2$	Description of Error: Correct Solution:

14. Solve the following triangles for all the unknown sides and angles. Round sides to the nearest tenth and angles to the nearest degree.

a)



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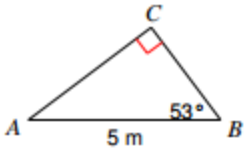

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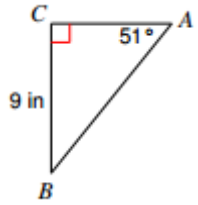

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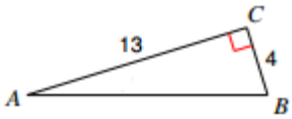

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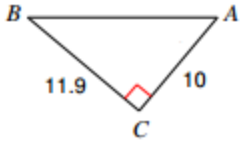

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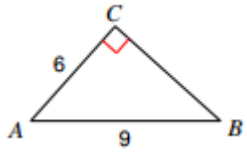

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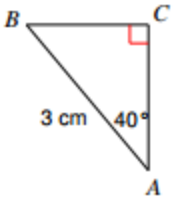

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