# Basic Skills Review Stations

| Station | Answer(s) | For administrative use only |
|---|---|---|
| R | a) $-\frac{7}{30}$ b) $\frac{5}{12}$ c) $-\frac{1}{10}$ d) $8$ e) $\frac{8}{9}$ | |
| $E_1$ | a) $\frac{15}{2} - \frac{23w}{5}$ b) $7x - 14$ | |
| V | a) $x = 3$ b) $y = \frac{13}{5}$ c) $m = 7$ | |
| I | a) $(1, -10)$ b) $(2, -3)$ | |
| $E_2$ | a) $\frac{5x^5}{6}$ b) $32x^7y^{11}$ c) $\frac{15}{2x^2}$ d) $5xy^2$<br>e) $10b^2 + b - 3$ f) $x^2 - 12x + 36$ g) $9m^2 - 4$ | |
| W | a) $7t^2(1-2t)$ b) $2x(2y-z+5)$ c) $(5x-3)(5x+3)$<br>d) $(a-2)(a-5)$ e) $(2m-3)(3m+4)$ f) $(4z-3)^2$ | |

MCR3U **Basic Skills Review** Name: ___Ms. Pert_____

1. Evaluate. Answer should be a number.

a) $\frac{-5}{6}+\frac{3}{5}$ common denominator [LCD = 30]

$= \frac{-5\cdot 5}{6\cdot 5} + \frac{3\cdot 6}{5\cdot 6}$

$= \frac{-25}{30} + \frac{18}{30}$ [Equivalent Fractions]

$= \frac{-25+18}{30}$

$= \frac{-7}{30}$

b) $\frac{1}{3}-\left(\frac{-1}{12}\right)$ common denominator

$= \frac{1}{3}+\frac{1}{12}$ [Simplify signs]

$= \frac{4}{12}+\frac{1}{12}$

$= \frac{5}{12}$

c) $\frac{-\cancel{8}^{1}}{\cancel{16}_{2}}\left(\frac{\cancel{8}^{1}}{\cancel{15}_{5}}\right)$ reduce when multiplying

$= \frac{-1}{10}$

[Look for common factors between any numerator & denominator.]

d) $\frac{1}{4}\div\frac{1}{32}$ change division to multiplication

$= \frac{1}{\cancel{4}_{1}} \times \cancel{32}^{8}$

$= 8$

e) $\frac{\cancel{5}^{1}}{\cancel{10}_{2}}+\frac{\cancel{2}^{1}}{\cancel{4}_{2}}-\left(\frac{\cancel{2}^{1}}{\cancel{6}_{3}}\times\frac{1}{3}\right)$ BEDMAS!

$= \frac{1}{2}+\frac{1}{2}-\left(\frac{1}{3}\times\frac{1}{3}\right)$ [Start with any reducing.]

$= 1-\frac{1}{9}$

$= \frac{9}{9}-\frac{1}{9}$

$= \frac{8}{9}$

2. Simplify. Answer will have variables.

a) $-\frac{1}{4}(4w-6)-\frac{3}{5}(6w-10)$ [Distributive Property]

$= \frac{-1}{4_1}(4w) - \frac{1}{4_2}(-6)^{3} - \frac{3}{5}(6w) - \frac{3}{1}(-\cancel{10}^{2})$

$= -w + \frac{3}{2} - \frac{18w}{5} + 6$ [Collect Like Terms].

$= -w - \frac{18w}{5} + \frac{3}{2} + 6$

$= -\frac{5w}{5} - \frac{18w}{5} + \frac{3}{2} + \frac{12}{2}$

$= -\frac{23w}{5} + \frac{15}{2}$

$= \frac{15}{2} - \frac{23w}{5}$

b) $4x - (3x-1) - 3 + 6(x-2)$ ← everything in the brackets is multiplied by -1

$= 4x - 3x + 1 - 3 + 6x - 12$

$= 4x - 3x + 6x + 1 - 3 - 12$

$= 7x - 14$

3. Solve. Find the value of the variable that makes the statement true.

a) $5(x-3)-2x=-6$ [Expand and Simplify before Solving]

$5x-15-2x=-6$

$3x-15=-6$ [Isolate $x$].

$3x-15+15=-6+15$

$3x=9$

$\frac{3x}{3}=\frac{9}{3}$

$x=3$

b) $4y-(3y-1)=6(y-2)$

$4y-3y+1=6y-12$

$y+1=6y-12$

$1+12=6y-y$ [Variables on one side, constants on other side],

$13=5y$

$\frac{13}{5}=y$

c) $\frac{2m+1}{3}-\frac{m+1}{4}=3$ [Clear the denominators].

LCM = 12 Maintain balance.

$12\left[\frac{2m+1}{3}\right]-12\left[\frac{m+1}{4}\right]=12(3)$

$4(2m+1)-3(m+1)=36$

$8m+4-3m-3=36$

$5m+1=36$

$5m=35$

$m=7$

→ two or more equations

4.a) Solve the system by the method of substitution.

→ isolate a variable, then substitute expression into other equation.

* The only good choice for isolation is "y" in ① since it's coefficient is 1.

① $11x - y = 21$
② $9x + 2y = -11$

In ①: $11x - 21 = y$

Sub. y into ②: $9x + 2(11x - 21) = -11$
$9x + 22x - 42 = -11$
$31x = 31$
$x = 1$

Sub. x into ①: $11(1) - y = 21$
$11 - 21 = y$
$-10 = y$

∴ The solution is $(1, -10)$.

b) Solve the system by the method of elimination.

→ Multiple one or both equations such that coefficients of x or y are equal.
Add or subtract the new equations to eliminate one of the variables.

① $x + 2y = -4$
② $3x - 4y = 18$

$\times 3$ ① $3x + 6y = -12$
$-$ ② $3x - 4y = 18$
$10y = -30$
$y = -3$

Sub. y into ①: $x + 2(-3) = -4$
$x - 6 = -4$
$x = 2$

∴ The solution is $(2, -3)$.

5. Simplify.

TIP: Reduce common factors between numerators & denominators.

a) $\left(\frac{2x^2}{3}\right)\left(\frac{5x^3}{x^2}\right)$

$= \frac{5x^5}{6}$

PRODUCT RULE

$x^m \cdot x^n = x^{m+n}$

b) $(2x^2y^3)^3(4xy^2)$

$= (2^3x^6y^9)(4xy^2)$

$= (8x^6y^9)(4xy^2)$

$= 32x^7y^{11}$

POWER OF A POWER RULE

$(x^m)^n = x^{mn}$

c) $\left(\frac{3x}{2}\right) \div \left(\frac{x^3}{5}\right)$

Multiply by the reciprocal.

$= \left(\frac{3x}{2}\right)\left(\frac{5}{x^3}\right)$

$= \frac{15x}{2x^3}$

Notice there are more factors of $x$ in the denom.

$= \frac{15}{2x^2}$

d) $(25x^3y^3) \div (5x^2y)$

$= \frac{25x^3y^3}{5x^2y}$

$= 5xy^2$

QUOTIENT RULE

$x^m \div x^n = x^{m-n}$

Expanding → Multiplying ... Product of Terms → Sum of Terms

e) $(2b-1)(5b+3)$ Distributive Property twice.

$= 10b^2 + 6b - 5b - 3$

$= 10b^2 + b - 3$

f) $(x-6)^2$

$= x^2 - 12x + 36$

Squaring a binomial results in a Perfect Square Trinomial.

$(x-6)^2$

$= (x-6)(x-6)$

g) $(3m-2)(3m+2)$

$= 9m^2 - 4$

Difference of Squares

Opposite of expanding.
Sum of terms → Product of terms.

6. Factor.

a) $7t^2 - 14t^3$

Always look for a common factor first.

$= 7t^2(1 - 2t)$

GCF = $7t^2$

Divide the polynomial by the GCF to get the 2nd factor.

b) $4xy - 2xz + 10x$

GCF = $2x$

$= 2x(2y - z + 5)$

c) $25x^2 - 9$

Difference of Squares

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

d) $a^2 - 7a + 10$

Simple Trinomial

M 10
A -7
N -2, -5

$= (a - 2)(a - 5)$

e) $6m^2 - m - 12$

Complex Trinomial

M -72 ← This is "a" times "c", "6" times "-12".
A -1 ← This is "b".
N -9, 8

$\frac{6}{-9}, \frac{6}{8}$ ← Put the "a" value in the numerator.
← put your numbers in the denom.

$= \frac{6 \div 3}{-9 \div 3}, \frac{6 \div 2}{8 \div 2}$ ← Reduce the fractions.

$= \frac{2}{-3}, \frac{3}{4}$ ← These are the values that go into each factor.

1st factor, 2nd factor

Keep the signs exactly the same. Order matters!

$= (2m - 3)(3m + 4)$

f) $16z^2 - 24z + 9$

Perfect Square Trinomial

$= (4z - 3)^2$

Remember the pattern?

$\sqrt{16z^2} = 4z$ $\sqrt{9} = 3$

Double the product of these square roots gives $24z$.

Remember → When you square a binomial you get a perfect square trinomial!