# U1D2_T Review of Grade 10 Work

Sunday, February 3, 2019 7:55 PM

U1D2_T Review of...

$(x+2)(x+3)$

$= x^2+3x+2x+6$

$= x^2+5x+6$

$(y+1)(y+1)$

**U1D2 Warm Up:** Simplify.

$(y + 7)(y^2 - 2y + 9) - 3[8 - 4(y + 1)^2]$

$= y^3 - 2y^2 + 9y + 7y^2 - 14y + 63 - 3[8 - 4(y^2+2y+1)]$

$= y^3 + 5y^2 - 5y + 63 - 3[8 - 4y^2 - 8y - 4]$

$= y^3 + 5y^2 - 5y + 63 + 12y^2 + 24y - 12$

$= y^3 + 17y^2 + 19y + 51$

note $8-4 = 4$ and $-3(4) = -12$

MCR 3UI

## Review of Grade 10 Prerequisite Skills

**Factoring** * ALWAYS LOOK for Common Factor FIRST

Common Factoring

→ 'factor out' the GCF (greatest common factor) If you started with 2 terms, there will be two terms in bracket

$36x^7 + 24x^5$

$= 12x^5(3x^2+2)$

GCF: for each letter "variable" we choose the lowest exponent.

biggest number that divides into 36 and 24.

$10a^2b + 5ab - 15a$

GCF is $5a$

$= 5a(2ab+b-3)$

Simple Trinomial Factoring → trinomials of the form $ax^2+bx+c$, where $a=1$

To factor, find two numbers that multiple to c and add to a.

$x^2 - 8x + 15$

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

Multiply to 15
Add to −8

1×15
3×5
−3, −5

* always double check your signs after finding the two numbers.

$a^2 - 3a - 40$

$= (a-8)(a+5)$

M −40
A −3

1×40
2×20
4×10
5×8
−8, +5

* NOTE: At some point during the note, you may need to write on the back of the handout(s) if you run short on space.

Multi-Step Trinomial Factoring trinomials of the form $ax^2+bx+c$, where $a \neq 1$

MUST use decomposition, aussie or cross-products.

$2y^2 - 7y + 5$

"Decomposition" • need two numbers

$2y^2 - 7y + 5$

"Decomposition"

- need two numbers Multiply to (a)(c)
  $(2)(5) = 10$

$= \underbrace{2y^2 - 2y}_{\text{CF 1st 2 terms}} \underbrace{-5y + 5}_{\text{CF 2nd 2 terms}}$

Add to $-7$

'decompose' $-7y$ to $-2y - 5y$

$1 \times 10$

$2 \times 5$

order does not matter.

$= 2y(y-1) - 5(y-1)$

$= (2y-5)(y-1)$

this is factor by grouping

"AUSSIE" Method

$\frac{(ax \quad)(ax \quad)}{a}$

Mult: a(c)
Add: b

$2y^2 - 7y + 5$

$= \frac{(2y \quad)(2y \quad)}{2}$

M $2(5) = 10$
A $-7$

$-2, -5$

$= \frac{(2y-2)(2y-5)}{2}$

$= \frac{{}^{1}\cancel{2}(y-1)(2y-5)}{\cancel{2}_{1}}$

Common Factor each bracket and reduce

$= (y-1)(2y-5)$

* LOOK for C.F. first!

$12s^2 - 14s - 6$

$= 2(6s^2 - 7s - 3)$ Decomp

M $-18$
A $-7$
$-9, 2$

$= 2(6s^2 - 9s + 2s - 3)$

$= 2[3s(2s-3) + (2s-3)]$

$= 2(3s+1)(2s-3)$

AUSSIE $2(6s^2 - 7s - 3)$

M $-18$
A $-7$
$-9, 2$

$= \frac{2(6s-9)(6s+2)}{6}$

$= 2(\cancel{3}^{1})(2s-3)(\cancel{2}^{1})(3s+1)$

$2y^2 - 7y + 5$

Cross Products

list all factor pairs of a

list all factor pairs of c

| | |
|---|---|
| 1 | 1 |
| 2 | 5 |

5
1

* write one set of factor pairs in reverse order

* try all possible 'crosses'

since c is positive both numbers will have same sign so looking for sum of 7 need answer straight

$$= \frac{2(\cancel{3}^{1})(2s-3)(\cancel{2}^{1})(3s+1)}{\cancel{6}_{1}}$$

$$= 2(2s-3)(3s+1)$$

Cross Products. $2(6s^2-7s-3)$

$$\begin{array}{cc|cc} 1 & 2 & 1 & 3 \\ 6 & 3 & 3 & 1 \end{array}$$

$6-3 \neq 7$

$$\begin{array}{cc|cc} 1 & 2 & 1 & 3 \\ 6 & 3 & 3 & 1 \end{array}$$

$18-1 \neq 7$

$$\begin{array}{cc|cc} 1 & 2 & 1 & 3 \\ 6 & 3 & 3 & 1 \end{array}$$

$6-3 \neq 7$

Multiplies to a negative so need a difference of 7

$$\begin{array}{cc|cc} 1 & 2 & 1 & -3 \\ 6 & 3 & 3 & +1 \end{array}$$

$9-2=7$

Now put signs on the 3, 1 to get a negative seven.

$2(2y-3)(3y+1)$

So looking for sum of 7

read answer straight across and put in correct sign.

$(y-1)(2y-5)$

Special Factoring

d. of s. again!

$81y^4 - 16$

only 2 terms

difference

Perfect Square − Perfect Square

Difference of Squares

$= (9y^2 - 4)(9y^2 + 4)$

$= (3y-2)(3y+2)(9y^2+4)$

$\sqrt{81y^4}$ at beginning of both brackets

$\sqrt{16}$ at end of both brackets

$25x^2 - 70x + 49$

$= (5x-7)^2$

Perfect Square

$\sqrt{25x^2} = 5x$

$\sqrt{49} = 7$

check: middle term needs to be "twice the product"

$2 \times 5x \times -7$
$= -70x$

Perfect Sq. − Perfect Square

$[w^2 + 2w + 1] - y^2$

* DIFFERENCE of Squares within factor by grouping

$= (w+1)^2 - y^2$

$= (w+1-y)(w+1+y)$

$2y^3 - 6y^2 - 5y + 15$

Factor By Grouping (4 terms only choices are Common Factor, Grouping)

$= 2y^2(y-3) - 5(y-3)$

$= (2y^2-5)(y-3)$

## Solving Linear Equations

Remember, solving an equation means "find all the values of the variable that make the equation true".

A linear equation has only one variable with the exponent of "1".

Steps:

1. Clear any fractions (multiply all terms by a common denominator). called the lowest common multiple
2. Expand any brackets.
3. Collect the variable terms on one side of the equal sign, constant terms on the other side.
4. Combine like terms.
5. Isolate the variable by dividing out any coefficient.

Examples

$5(x - 3) - 2x = -6$

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

$3x - 15 = -6$

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

$3x = 9$

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

$$\frac{y-1}{3} = \frac{6}{1}$$

fraction = fraction

you can "cross multiply"

$$\frac{y-1}{3} \times \frac{6}{1}$$

* you can only cross multiply across an equal sign

$$1(y-1) = 3(6)$$

$$y-1 = 18$$

$$y = 19$$

* the factors attached by the cross get multiplied together.

<u>Solving Quadratic Equations</u>

A quadratic equation has the form

$ax^2 + bx + c = 0$.

Steps:

1. Expand any brackets.
2. Collect like terms.
3. Write equation as shown above (so that it equals zero)
4. Factor the quadratic.
5. Set each factor to zero and solve each linear factor.

Examples

$2y^2 + 7y + 3 = 0$

$(y+3)(2y+1) = 0$

$y+3=0$ OR $2y+1=0$

$\boxed{y=-3}$ $\quad 2y=-1$

$\boxed{y=\frac{-1}{2}}$

M $2(3)=6$

A $7$

$1, 6$

needed for Decomp & Aussie

$\begin{array}{c|c} 1 & 1 \quad 3 \\ 2 & 3 \quad 1 \end{array}$

use this for cross products.

$x(x-4) = -4$

$x^2-4x+4=0$

$(x-2)(x-2)=0$ OR $(x-2)^2=0$

$x-2=0$

$\boxed{x=2}$

* only one answer (Graphically, parabola touches the x-axis)

U1D2 HW: Pg. 3 #1-7 (every other one for each question)