U1D8_T Equivalent Algebraic Expressions and Function Notation

Monday, February 4, 2019 9:23 AM

U1D8_T Equivalen...

U1D8 MCR 3UI **Function Notation and Equivalent Algebraic Expressions**

Warm Up:

Simplify and state restrictions for:

a) $\dfrac{3x}{6x^2-x-2}+\dfrac{2x}{10x^2-x-3}$

$1 \quad 2 \quad +1 \quad 2$
$6 \quad 3 \quad -2 \quad 1$

$1 \quad 2 \quad 1 \quad 3$
$10 \quad 5 \quad -3 \quad 1$

$$= \frac{3x}{(2x+1)(3x-2)} + \frac{2x}{(2x+1)(5x-3)}$$

$$= \frac{3x(5x-3)+2x(3x-2)}{(2x+1)(3x-2)(5x-3)}$$

$$= \frac{15x^2-9x+6x^2-4x}{(2x+1)(3x-2)(5x-3)}$$

$$= \frac{21x^2-13x}{(2x+1)(3x-2)(5x-3)}$$

$x \neq -1, \frac{2}{3}, \frac{3}{5}$

BEDMAS

b) $\dfrac{6}{y}-\dfrac{4x-4}{3y^5}\times\dfrac{9y^4}{x^2-1}$

$$= \frac{6}{y} - \frac{4\cancel{(x-1)}\,\cancel{(9y^4)}^{3}}{\cancel{3}y^5\cancel{(x-1)}(x+1)}$$

$$= \frac{6}{y} - \frac{12}{y(x+1)}$$

$\boxed{\text{LCD } y(x+1)}$

$$= \frac{6(x+1)-12}{y(x+1)}$$

$$= \frac{6x+6-12}{y(x+1)}$$

$$= \frac{6x-6}{y(x+1)}$$

$y \neq 0, x \neq \pm 1$

Function Notation

Function Notation allows us to name a function and differentiate between them.

For example: "f at x" OR "f of x"

1. $f(x) = x^2 - 3x + 4$ rather than $y = x^2 - 3x + 4$

2. $g(x) = 6x^2 + x - 2$ rather than $y = 6x^2 + x - 2$

3. $h(x) = -5(x+2)(x-1)$ rather than $y = -5(x+2)(x-1)$

Calculate the following:

a) $f(2)$ if $f(x) = x^2 - 3x + 4$

evaluate $f(x)$ when $x=2$

(sub. $x=2$ into the expression and simplify).

$f(2) = (2)^2 - 3(2) + 4$

$f(2) = 4 - 6 + 4$

$f(2) = 8 - 6$

$\boxed{f(2) = 2}$

$\therefore f(2) = 2$

i.e. $(2,2)$ is a point on the graph.

b) $h(-1)$ if $h(x) = -5(x+2)(x-1)$

$h(-1) = -5(-1+2)(-1-1)$

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

$\boxed{h(-1) = 10}$

means $(-1,10)$ is a point on the parabola

Equivalent Algebraic Expressions

Determine whether g(x) is the simplified version of f(x). If it is, then state the restrictions needed.

1. $f(x) = \dfrac{x^2 - 2x - 15}{x^2 - x - 20}$ and $g(x) = \dfrac{x+3}{x+4}$, $x \neq -4$

$$f(x) = \frac{\cancel{(x-5)}(x+3)}{\cancel{(x-5)}(x+4)}$$

$$f(x) = \frac{x+3}{x+4}, \quad x \neq -4, 5$$

$$\boxed{\therefore f(x) = g(x) \text{ provided } x \neq -4, 5}$$

m-12
A 1 4, -3

$\frac{1}{3}\cancel{\frac{3}{1}}\frac{1}{2}$

2. $f(x)=\dfrac{6x^2+x-2}{2x-1}$ and $g(x)=\dfrac{3x^2-x-2}{x-1}$

$f(x)=\dfrac{(3x+2)(2x-1)}{2x-1}$

$f(x)=3x+2,\ x\neq\frac{1}{2}$

$g(x)=\dfrac{(3x+2)(x-1)}{(x-1)}$

$g(x)=3x+2,\ x\neq 1$

$\boxed{\therefore\ f(x)=g(x) \text{ when } x\neq\frac{1}{2},1.}$

3.

$f(x)=(x+2)(x-1)-(x+1)(x-4)$ and

$g(x)=4x-1$

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

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

$g(x) = 4x+2$

$\therefore f(x) \neq g(x)$

pg. 68 (6i)

$$\frac{4}{2s-12} - \frac{5}{5s-5}$$

$$= \frac{4}{2(s-6)} - \frac{5}{5(s-1)}$$

$$= \frac{2}{s-6} - \frac{1}{s-1}$$

then get LCD!

U1D8 HW: Pg. 179 #6-10(ac of each), Handout 1-1, Challenge Questions