Operations on Functions

- 1) Let's Go Over the Homework and finish p.3
- 2) Take little quiz on simplifying radicals and re-writing the forms
- 3) Notes on Operations of Functions

Refresher:

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

Find f(3)

Find f(x+1)

Ex: Let
$$f(x) = 3x + 2$$
 and $g(x) = 4 - 5x$

Find:

$$a) f(x) + g(x)$$

b)
$$f(x) - g(x)$$

c)
$$f(x) * g(x)$$

d)
$$\frac{f(x)}{g(x)}$$

Try another. Find the sum, difference, product and quotient with the given.

$$f(x)=x^2-4$$
 $g(x)=3x+1$

Sum
$$(f+g)(x) = x^2 - 4$$

$$g(x) = 3x + 1$$

Product
$$(f+g)(x) = f(x) + g(x)$$

$$(\chi^2 - 4) + (3\chi + 1)$$

$$\chi^2 - 4 + 3\chi + 1$$

$$\chi^2 + 3\chi - 3$$
Difference
$$(f-g)(x) = f(x) - g(x)$$

$$(\chi^2 - 4) - (3\chi + 1)$$
Quotient
$$(\frac{f}{g})(x) = \frac{f(x)}{g(x)}$$

$$\chi^2 - 4 - 3\chi - 1$$

$$\chi^2 - 3\chi - 5$$

ADDING & SUBTRACTING RADICALS

- 1 SIMPLIFY all radicals.
- 2 Identify radicals with the **SAME INDEX** and **SAME RADICAND**. Only these can be combined!
- For common radicals, add/subtract the coefficients and KEEP THE COMMON RADICAL.

1.
$$3\sqrt{27} - 2\sqrt{12}$$
 2. $3\sqrt[3]{54} - 2\sqrt[3]{2} + 7\sqrt[3]{-16}$

3.
$$7\sqrt[4]{48} - 2\sqrt[4]{3} + 3\sqrt[3]{72}$$
4. $10\sqrt{28} + \sqrt[3]{-56} - 4\sqrt{175}$

Multiplying Radicals

- Multiply coefficients, then use the **PRODUCT RULE**: $\sqrt[n]{a} \cdot \sqrt[n]{b} =$
- **SIMPLIFY** the resulting radical.
 - 1) $\sqrt{27} \cdot \sqrt{5}$
- 2) $3\sqrt{10} \cdot -2\sqrt{18}$

- 3) $\sqrt{6x^4} \cdot 5\sqrt{8x^5}$
- 4) $\sqrt[3]{-3a^7b^4} \cdot \sqrt[3]{36a^6b^2}$

Try These:

a)
$$\sqrt{10} \left(5\sqrt{5} - 2\sqrt{2} \right)$$
 b) $\left(8 - \sqrt{10} \right) \left(3 - \sqrt{10} \right)$

b)
$$(8-\sqrt{10})(3-\sqrt{10})$$



Operations with Radical Functions

Find the sum, difference, product and quotient with the given.

$$f(x) = 5\sqrt{2x} + 1 \qquad g(x) = 3\sqrt{2x} - 1$$

Sum

$$(f+g)(x) = f(x) + g(x)$$

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

$$5\sqrt{2x}+1+3\sqrt{2x}-1$$

$$2\sqrt{2x}$$
Difference

$$(f-g)(x) = f(x) + g(x)$$

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

$$5\sqrt{2x}+1+3\sqrt{2x}-1$$
Quotient

$$(f-g)(x) = f(x) - g(x)$$

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

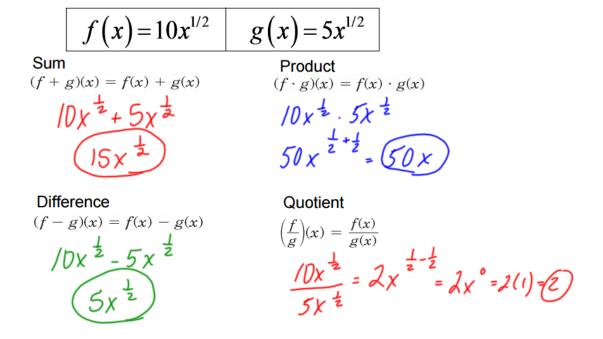
$$5\sqrt{2x}+1-3\sqrt{2x}+1$$

$$2\sqrt{2x}+2$$

$$\sqrt{2x}+2$$

Operations with Rational Exponent Form

$$f(x)=10x^{1/2}$$
 $g(x)=5x^{1/2}$



HW: wkst on Operations with Functions