

Name: _____ Hour: _____ Date: _____

ALGEBRA I BOOT CAMP TAKE 2

ANSWER KEY

Simplifying rational expressions:

Example #1: Simplify each expression.

a. $\frac{3x^3 - 2x}{5x^3}$
 $\frac{3x^2 - 2}{5x^2}$

You practice: Simplify each expression.

1. $\frac{20d^4}{70d^2}$
 $\frac{2d^2}{7}$

2. $\frac{3x - 24}{24}$
 $\frac{x}{8} - 1$ OR $\frac{x - 8}{8}$

3. $\frac{20}{4p + 36}$
 $\frac{5}{p+9}$

4. $\frac{8n^3 - 4n^2}{12n^4 - 6n^3}$
 $\frac{4n - 2}{6n^2 - 3n}$

5. $\frac{8x^3}{2x^3 + 10x}$
 $\frac{4x^2}{x^2 + 5}$

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Simplifying expressions using order of operations:

ORDER OF OPERATIONS:

P

E

M

D

A

S

Example #2: Simplify each expression.

a. $4(4x^{-1})^{-1}$

x

You practice: Simplify each expression.

1. $4(5x - 2)^{-1}$

$\frac{4}{5x - 2}$

2. $-(x - 2)^2$

$-x^2 + 4x - 4$

3. $x^2 - (x + 2)$

$x^2 - x - 2$

4. $2(x^2)^{1/2}$

$2x$

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5. $3\left(\frac{x-8}{3}\right)^{-1}$

$x - 8$

6. $3(2x - 7)^{-1}$

$\frac{3}{2x - 7}$

7. $3(3x^{-1})^{-1}$

x

8. $2(3x^{-1}) - 7$

$\frac{6}{x} - 7$

9. $3\left(\frac{x+4}{3}\right)^{-1}$

$\frac{9}{x+4}$

10. $4(2x^2)^2 - 2x^2$

$16x^4 - 2x^2$

11. $2(4x^2 - x)^2$

$32x^4 - 16x^3 + 2x^2$

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DOMAIN:

Look for FRACTION (DENOMINATOR) EXPONENT on the VARIABLE!

$$x^{1/n}:$$

If n is EVEN: all real nonnegative #s

If n is ODD: all real #s

Look for VARIABLE in the DENOMINATOR:

$$\frac{1}{x}:$$

Set denominator equal to 0 and remove the value from the domain: all real #s, $x \neq 0$

Example #3: State the domain.

a. $x^2 + x$

all real numbers

b. $\sqrt[10]{x}$

all real nonnegative numbers

c. $\frac{4}{2x-5}$

all real numbers,

$x \neq \frac{5}{2}$

You practice: State the domain.

1. $-2x^3 + 2x$

all real numbers

2. $\frac{5x^2-2}{3x^2}$

all real numbers, $x \neq 0$

3. $2x$

all real numbers

4. $2 - \frac{1}{2x}$

all real numbers, $x \neq 0$

5. \sqrt{x}

all real nonnegative numbers

6. $6x^2 - x$

all real numbers

7. $3x^{1/6} + x^{1/3}$

all real nonnegative numbers

8. $\frac{2}{x^{3/2}}$

all real nonnegative numbers,

$x \neq 0$

9. $\frac{\sqrt{x}}{3x-1}$

all real

nonnegative numbers, $x \neq \frac{1}{3}$

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Composition Practice:

Example #1: Let $f(x) = 2x - 1$, $g(x) = 3x$, and $h(x) = x^2 + 1$. Perform the indicated operation.

a. $g(f(x))$

$6x - 3$

b. $h(g(x))$

$9x^2 + 1$

c. $f(h(x))$

$2x^2 + 1$

You practice:

1. Let $f(x) = 9 - x$, $g(x) = x^2 + x$, and $h(x) = x - 2$. Perform the indicated operation.

a. $h(g(x))$

$x^2 + x - 2$

b. $g(h(x))$

$x^2 - 3x + 2$

c. $f(h(x))$

$-x + 11$

2. Let $f(x) = 4x^2 - x$ and $g(x) = 2x^2$. Perform the indicated operation and state the domain.

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

$6x^2 - x$

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

$-2x^2 + x$

c. $f(x) \cdot g(x)$

$8x^4 - 2x^3$

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

$\frac{4x - 1}{2x}$

e. $f(g(x))$

$16x^4 - 2x^2$

f. $g(f(x))$

$32x^4 - 16x^3 + x^2$

g. $f(f(x))$

$64x^4 - 32x^3 + x$

h. $g(g(x))$

$8x^4$

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QUIZ REDO: Redo this page of your quiz – correctly!

Let $f(x) = 5x^3 - 2x$ and $g(x) = 3x^3$. Perform the indicated operation and state the domain.

8.) $g(x) - f(x)$

9.) $\frac{f(x)}{g(x)}$

answer: $-2x^3 + 2x$

answer: $\frac{5x^2 - 2}{3x^2}$

domain: **all real numbers**

domain: **all real numbers, $x \neq 0$**

Let $f(x) = 4x^{-1}$ and $g(x) = 5x - 2$. Perform the indicated operation and state the domain.

10.) $f(g(x))$

11.) $f(f(x))$

answer: $\frac{4}{5x - 2}$

answer: x

domain: **all real numbers, $x \neq \frac{2}{5}$**

domain: **all real numbers**