

Do Now

Multiply $(x-3)(x+3)$
 $x^2 - 9$

b) $\frac{0}{5} = ?$ 0

c) $\frac{5}{0} = ?$ undefined

d) $\frac{0}{0} = ?$ indeterminate

Aim: Restrictions with Variables in the Denominator

1. Mavis says that the expression $\frac{5}{x+2}$ has a meaningful value for whatever value one chooses to assign to x . Do you agree? Explain. NO b/c $x \neq -2$.

$\frac{5}{-2+2} = \frac{5}{0} = \text{undefined}$

2. Rewrite the following as a compound statement $\frac{4}{2x-8}$.

$2x - 8 = 0$
 $+8 +8$
 $\frac{2x}{2} = \frac{8}{2}$
 $x = 4$

$\frac{4}{2x-8}$ and $x \neq 4$

3. For what value(s) of x is $\frac{6x}{3x-1}$ undefined?

$\frac{6x}{3x-1}$

$3x - 1 = 0$
 $+1 +1$
 $3x = 1$
 $\frac{3x}{3} = \frac{1}{3}$
 $x = \frac{1}{3}$

4. For what value(s) of x is $\frac{x+4}{x^2-9}$ undefined?

$x^2 - 9 = 0$
 $\sqrt{x^2} = \sqrt{9}$
 $x = \pm 3$

$\boxed{\pm 3}$

5. Write an expression with the restrictions:

a. $x \neq 7$

$$\frac{4}{x-7}$$

b. $x \neq -3$

$$\frac{4}{x+3}$$

c. $x \neq 0$

$$\frac{4}{x} \quad \text{⊙}$$

6. Consider:

$$\frac{x^2-25}{(x^2-9)(x+4)}$$

a. Is it permissible to let $x = 5$ in this expression?

yes!

b. Is it permissible to let $x = 3$ in this expression?

NO!

c. Give all the values of x that are *not* permissible in this expression.

$\pm 3, -4$

Directions: For the following examples determine which value(s) of "x" would make the fraction undefined.

<p>7.</p> $\frac{x}{x-5}$ $x - 5 = 0$ $+5 \quad +5$ $\boxed{x = 5}$	<p>8.</p> $\frac{4}{x+12}$ $x + 12 = 0$ $-12 \quad -12$ $\boxed{x = -12}$	<p>9.</p> $\frac{5n}{2n-1}$ $2n - 1 = 0$ $+1 \quad +1$ $\frac{2n}{2} = \frac{1}{2} \quad \quad n = \frac{1}{2}$
<p>10.</p> $\frac{y+1}{x^2-81}$ $x^2 - 81 = 0$ $+81 \quad +81$ $\sqrt{x^2 = 81} \quad \quad \boxed{x = \pm 9}$	<p>11.</p> $\frac{x+3}{3x-12}$ $3x - 12 = 0$ $+12 \quad +12$ $\frac{3x}{3} = \frac{12}{3} \quad \quad \boxed{x = 4}$	<p>12.</p> $\frac{x+16}{6x+6}$ $6x + 6 = 0$ $-6 \quad -6$ $\frac{6x}{6} = \frac{-6}{6} \quad \quad \boxed{x = -1}$
<p>13.</p> $\frac{x^2-5x-35}{x^2-64}$ $x^2 - 64 = 0$ $\sqrt{x^2 = 64} \quad \quad \boxed{x = \pm 8}$	<p>14.</p> $\frac{x^2-100}{3x+9}$ $3x + 9 = 0$ $-9 \quad -9$ $\frac{3x}{3} = \frac{-9}{3} \quad \quad \boxed{x = -3}$	<p>15.</p> $\frac{y+1}{4-x}$ $4 - x = 0$ $+x \quad +x$ $\boxed{4 = x}$