

Warm Up



Write a polynomial function that has the roots -3, 2, 1.

$$\begin{aligned}x &= -3 & x &= 2 & x &= 1 \\x+3 &= 0 & x-2 &= 0 & x-1 &= 0 \\(x+3)(x-2)(x-1) &= 0 \\(x^2+x-6)(x-1) &= 0 \\(x^3 + x^2 - 6x - x^2 - x + 6) &= 0 \\x^3 - 7x + 6 &= y\end{aligned}$$

Obj: SWBAT solve rational equations

Agenda:

- Warm up
- Problem task
- Notes
- Practice
- Reflection

HW: 8-6G: 14-26 even,
28-30

ased Task 3.5.2: Lacrosse Stats

e goaltender on her school's lacrosse team. She blocked 2 shots out of 5 attempted shots in her first game this season, so her save percentage is now 40%. She is interested in knowing how her save percentage will change if she is able to make saves from now on without missing. A save percentage is a ratio, written in percent form. A rational equation is used to represent Latonya's save percentage, $f(x)$, where x is the number of consecutive successful saves she makes from now on. What is the meaning of the function's end behavior in the context of the problem situation?

Work with your partner to solve this problem.

$$f(x) = \frac{2 + x}{5 + x}$$

end behavior: asymptote (horizontal)

divide: $\frac{x}{x} = 1$ (at large x)

As L. keeps blocking shots, her save percentage approaches 100%

Notes: Solving Rational Equations

Steps:

1. Find the LCD
2. Multiply every term by the LCD
3. Cancel when possible.
4. Simplify the terms
5. Solve the resulting equation.
6. Check for extraneous solutions.

$$LCD: (x+2)(x+1)$$

$$\frac{x-1}{x^2+3x+2} + \frac{2x}{x+2} = \frac{x-1}{x+1}$$

$$(x+2)(x+1)$$

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

$$-\frac{x-1}{x+2} + \frac{2x^2}{-x^2} + 2x = \frac{x^2+x-2}{-x^2-x+2}$$

$$x^2+2x+1 = 0$$

$$(x+1)(x+1) = 0$$

$$x = -1$$

no solution

complete a customer's order in 15 fewer minutes by using copy machine A than machine B. By using both machines, he can complete the order in 18 minutes.
 Take Arthur to complete the order by using each machine alone?

$$A: x-15 \text{ min} \rightarrow 1 \text{ min: } \frac{1}{x-15} \rightarrow 18 \text{ min: } \frac{18}{x-15}$$

$$B: x \text{ min} \rightarrow 1 \text{ min: } \frac{1}{x} \rightarrow 18 \text{ min: } \frac{18}{x}$$

$$1 = \frac{18}{x-15} + \frac{18}{x}$$

$$LCD: x(x-15)$$

$$x(x-15) = \frac{18(x)\cancel{(x-15)}}{\cancel{x-15}} + \frac{18\cancel{(x)}(x-15)}{x}$$

$$x^2 - 15x = 18x + 18x - 270$$

$$x^2 - 36x + 270 = 0$$

$$x = \frac{51 \pm \sqrt{2601 - 4(270)}}{2}$$

$$= \frac{51 \pm \sqrt{1521}}{2} = \frac{51 \pm 39}{2}$$

$$x^2 - 57x + 270 = 0$$

$$= 45, 6$$

Reflection

Explain how factoring is involved in solving rational equations.