When the divisor of a rational expression is a linear factor in the form \_\_\_\_\_\_, you can use a process called \_\_\_\_\_\_, you can use a process called \_\_\_\_\_\_,

Compare the methods of the rational expression below to find the quotient.

$$\frac{x^2 + 5x + 6}{x + 2}$$

Long Division	Synthetic Division
$ \begin{array}{c cccc} x + 3 \\ x^2 + 5x + 6 \\   \hline                                $	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
'	×+3

To perform synthetic division, the divisor **must be** a linear term in the form x-c.

## Let's Practice!

1. Find the quotient of the rational expression below.

2. Find the quotient of the rational expression below.

$$\frac{9y^3 + 9y^2 - y + 2}{y + \frac{2}{3}}$$

$$\frac{-\frac{2}{3}}{4} = \frac{9}{4} - \frac{1}{2} = \frac{2}{4}$$

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

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

$$\frac{1}{4} - \frac{1}{4} - \frac{1}{4} = \frac{4}{4}$$

$$\frac{1}{4} - \frac{1}{4} - \frac{1}{4} = \frac{4}{4}$$

$$9y^2 + 3y - 3 + \frac{4}{y + 2/3}$$

## Try It!

3. Find the quotient of the rational expression below.

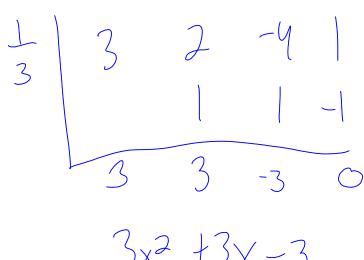
$$\frac{3u^{3} + 11u^{2} - 6u - 18}{u + 4}$$

$$\frac{3}{3} + \frac{11}{3} + \frac{1}{3} + \frac{1}$$

## Try It!

4. Find the quotient of the rational expression below.

$$\frac{3x^3 + 2x^2 - 4x + 1}{x - \frac{1}{3}}$$



## **BEAT THE TEST!**

Select all the expressions for d(x) that satisfy the parameters for synthetic division.

$$\frac{2x^4 - 9x^3 - 4x^2 + 5x - 13}{d(x)}$$

$$d(x) =$$

$$\square / -9 + x \times -9$$

$$\Box$$
  $x-13$ 

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

$$\Box$$
  $7x^2-x$ 

$$\begin{array}{ccc}
 & 7x^2 - x \\
 & 5x - 7 - 4x = \times 7
\end{array}$$

$$\Box$$
  $\epsilon$ 

Assignment: Practice workbook

Sections 1 - 4

"Check your Understanding for Topic 1: Section 4" (Online)

- Check your understanding is under classlink, algebra nation.