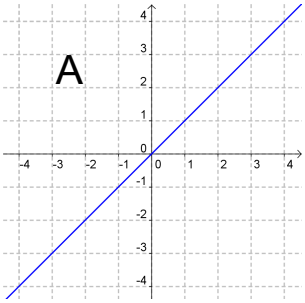
Unit 3 - Rational Expressions

Equivalent Rational Expressions

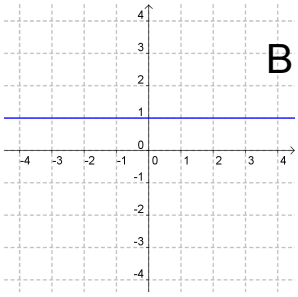
Feb 12-9:14 PM

1. Which graph shows the relation $y = 1$?

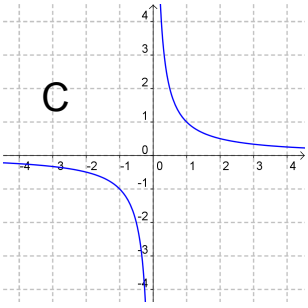
A



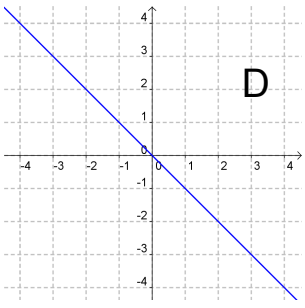
B



C



D



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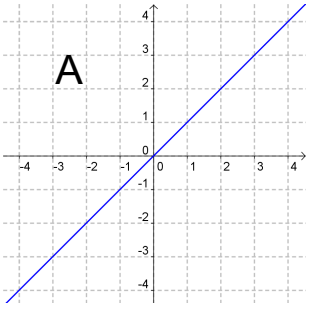
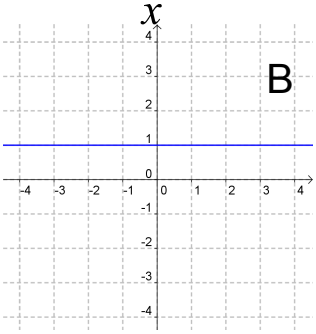
2. Which graph shows the relation $y = \frac{1}{x}$?

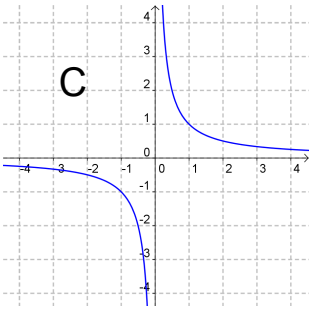
A



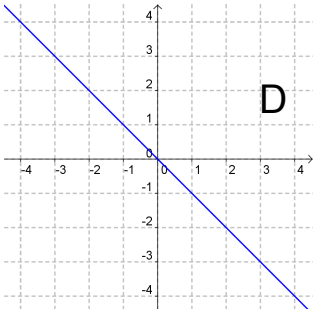
B



C



D



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3. Consider the relation: $y = \frac{x}{x}$

If you compared the graph of $y = \frac{x}{x}$ to $y = 1$, they would be:

A) always the same

B) mostly the same

C) sometimes the same

D) never the same

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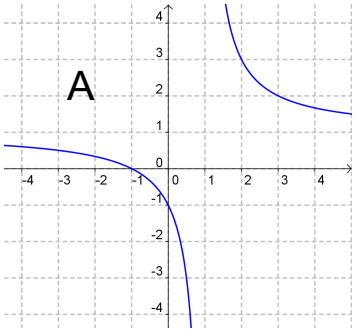
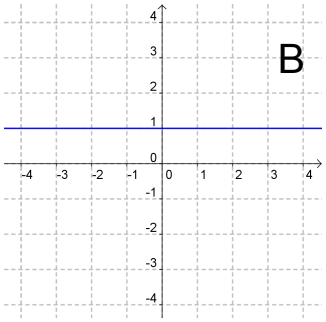
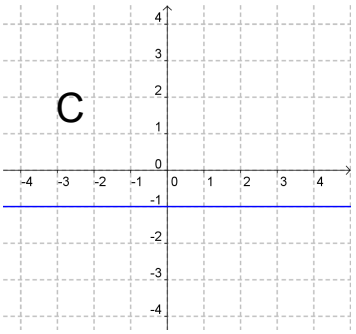
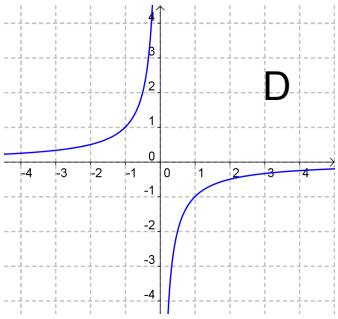
4. Which graph shows the relation $y = \dfrac{x+1}{x-1}$?









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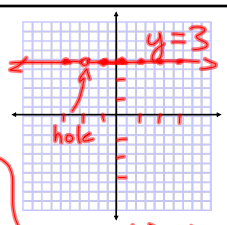
A. $y = \dfrac{3x+6}{x+2}$

x	y
-3	3
-2	undefined
-1	3
0	3
1	3
2	3
3	3



$y = \dfrac{3(-2)+6}{-2+2}$

$= \dfrac{0}{0}$

$y = \dfrac{3x+6}{x+2} \rightarrow y = 3$

$y = \dfrac{3(x+2)}{x+2}$

$y = 3$ but $x \neq -2$

$D = \{x \mid x \in \mathbb{R}, x \neq -2\}$

$R = \{3\}$

Without a table of values, look at denominator(s)

$x+2 \neq 0$

$x \neq -2$

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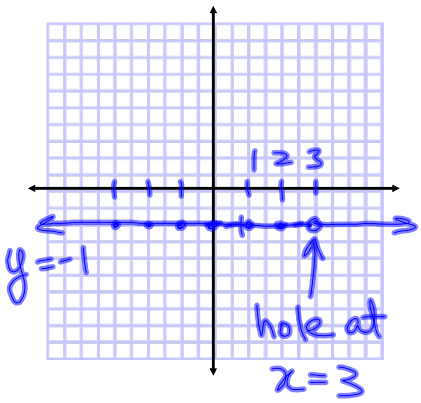
B. $y = \frac{x-3}{3-x}$

x	y
-3	-1
-2	-1
-1	-1
0	-1
1	-1
2	-1
3	undefined



$y = \frac{x-3}{3-x}$

$y = \frac{x-3}{-x+3}$ factor -1 from denom.

$y = \frac{(x-3)}{-1(x-3)}$

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

$y = -1$, $x \neq 3$

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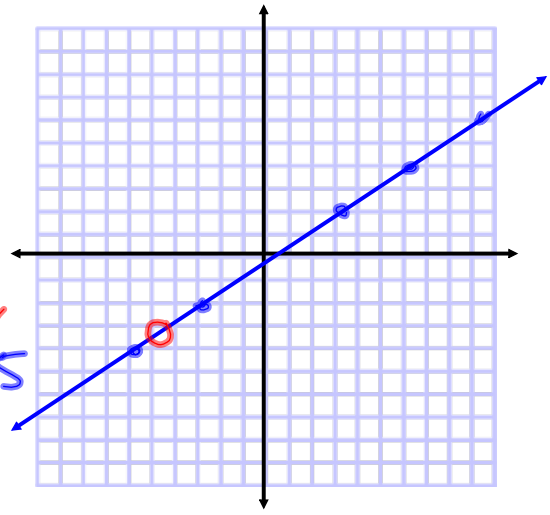
C. $y = \frac{2x^2+10x}{3x+15}$

$= \frac{2x(x+5)}{3(x+5)}$

$y = \frac{2}{3}x$, $x \neq -5$

slope $= \frac{2}{3}$



to find restrictions, must look at denominator of original function

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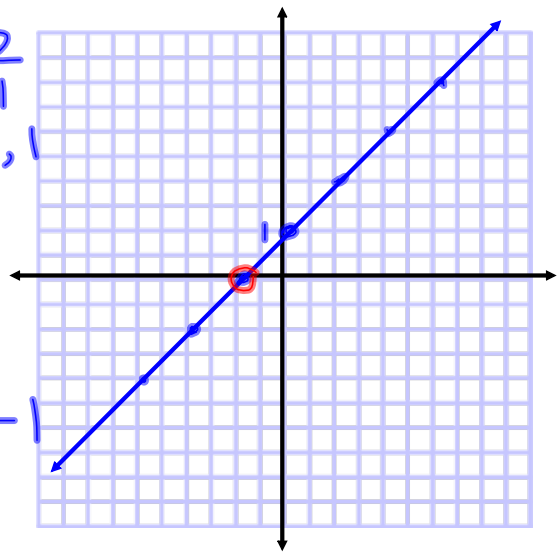
D. $y = \dfrac{x^2+2x+1}{x+1}$ → S 2, P 1, I 1, 1

$y = \dfrac{(x+1)(x+1)}{(x+1)}$

$y = x+1, \quad x \neq -1$

line, slope = 1, y-int = 1



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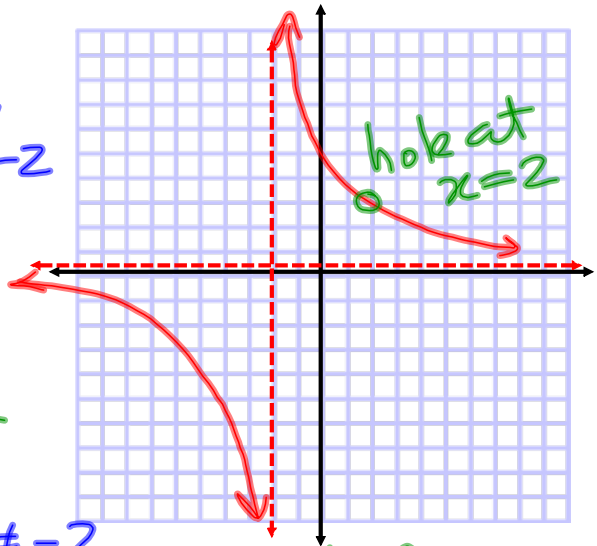
E. $y = \dfrac{x-2}{x^2-4}$ S 0, P -4, I 2, -2

$= \dfrac{(x-2)}{(x-2)(x+2)}$

hole at $x = 2$

$y = \dfrac{1}{x+2}, \quad x \neq -2, \quad x \neq 2$

reciprocal $y = \frac{1}{x}$ shift left 2



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List some mathematical techniques used when determining equivalent expressions for rational functions:

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When graphing rational functions, what noteworthy features may appear on the graph?

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The graphs of our equivalent expressions look the same, yet they are also different. How can we tell the graphs apart?

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How can we distinguish between the original and equivalent relations using some written notation?

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Homework:

p.40 # 1 - 3 (odd) (fundamentals - optional)
4 - 6 (odd), 8, 13, 15
16

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