Math III Honors Name: _____

Rational Functions – 90% of Test
Unit 1- Unit 2 10% of Test

Rational Functions and Their Graphs

Complete the table

Rational Function	Points of Discontinuity	Holes	Vertical Asymptotes	Horizontal Asymptote	Y-intercept	X-Intercept
1. $y=\frac{3x+2}{x-1}$						
2. $y=\frac{(x-5)}{(x-5)(x+4)}$						

Complex Fractions

Simplify

3. $\dfrac{\frac{1}{a}-\frac{1}{b}}{\frac{1}{b}+\frac{1}{a}}$

_____

Simplifying Rational Expressions

Simplify each rational expression. State any restrictions on the variable.

4. $\dfrac{20x^2+60x}{50x}$

5. $\dfrac{x^2+11x+28}{x+7}$

6. $\dfrac{27x-90}{15x^3-50x^2}\div\dfrac{1}{5x^2}$

7. $\dfrac{1}{x-2}\cdot\dfrac{x^2-10x+16}{x-5}$

8. $\dfrac{x-6y}{15y^3}+\dfrac{4x}{15y^3}$

9. $\dfrac{4}{3x}-\dfrac{x-6}{3x+15}$

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Solving Rational Equations

Solve each equation.

10. $\frac{6}{x-1}=\frac{2}{x+5}$

11 $\frac{2}{x^2-1}=\frac{4}{x+1}$

12. $\frac{3}{x+4}+\frac{5}{4}=\frac{18}{x+4}$

13. $\frac{6}{x-5}-\frac{1}{x^2-11x+30}=\frac{3}{x-5}$

14. y = $\frac{x+3}{x^2-x-12}$

Points of Discontinuity: x = _____

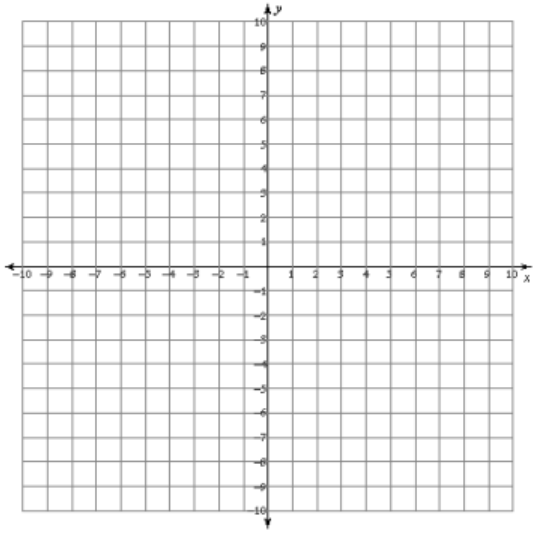
Holes: _____

Vertical Asymptotes: _____

Horizontal Asymptotes: _____

x-intercept:_____

y-intercept:_____



15. y = $\frac{3x-3}{x^2-x}$

Points of Discontinuity: x = _____

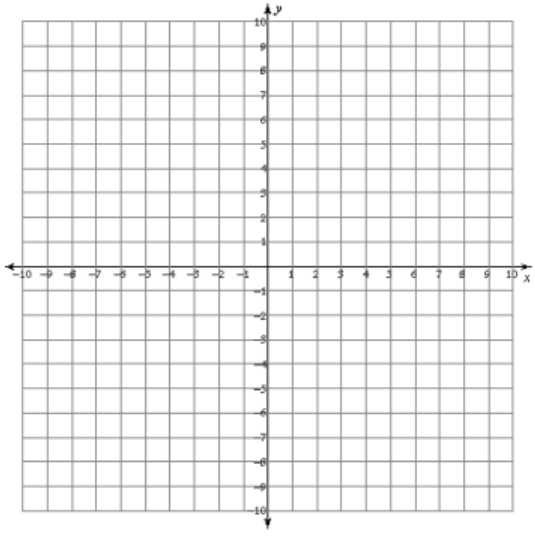
Holes: _____

Vertical Asymptotes: _____

Horizontal Asymptotes: _____

x-intercept:_____

y-intercept:_____



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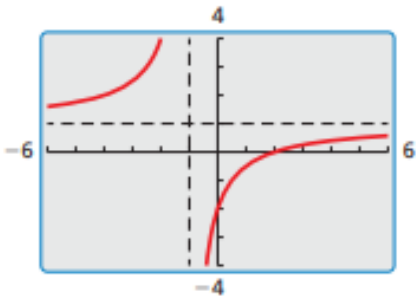
Match each graph with the correct function.

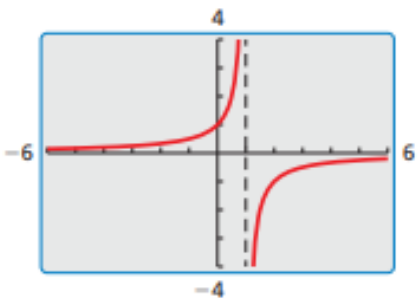
a. $g(x) = \dfrac{1}{x-1}$ **b.** $g(x) = \dfrac{-1}{x-1}$ **c.** $g(x) = \dfrac{x+1}{x-1}$

d. $g(x) = \dfrac{x-2}{x+1}$ **e.** $g(x) = \dfrac{x}{x+2}$ **f.** $g(x) = \dfrac{-x}{x+2}$

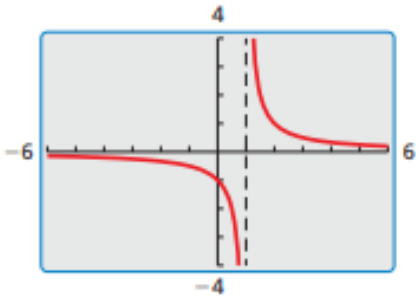
A.



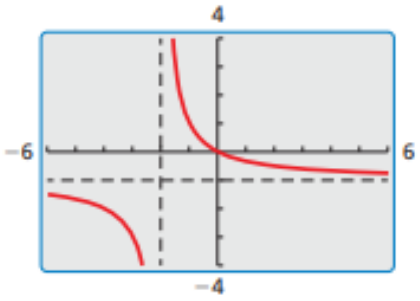
B.



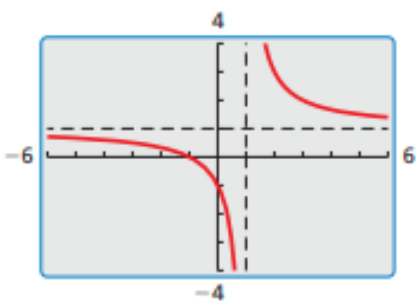
C.



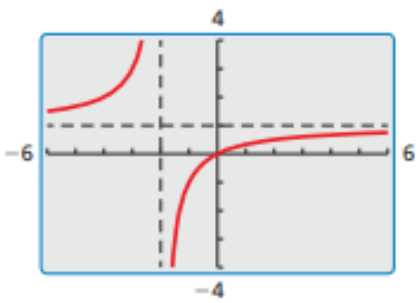
D.



E.



F.



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_____ 1. $y = \dfrac{2x^2 - 3x - 2}{x^2 - 2x - 8} = \dfrac{(x-2)(2x+1)}{(x-4)(x+2)}$

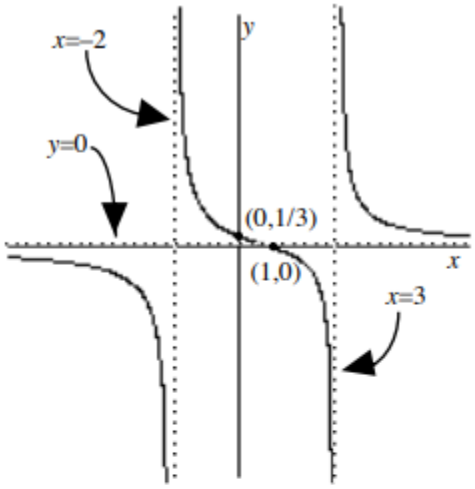
_____ 2. $y = \dfrac{x^2 - 2x - 8}{2x^2 - 3x - 2} = \dfrac{(x-4)(x+2)}{(x-2)(2x+1)}$

_____ 3. $y = \dfrac{2x - 2}{x^2 - x - 6} = \dfrac{2(x-1)}{(x-3)(x+2)}$

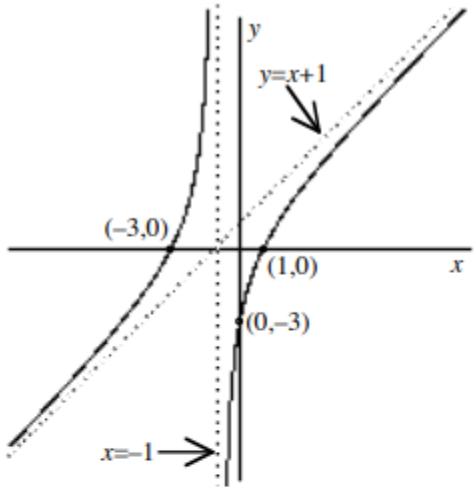
_____ 4. $y = \dfrac{2x^2 - 18}{x + 3} = \dfrac{2(x+3)(x-3)}{x+3}$

_____ 5. $y = \dfrac{x^2 + 2x - 3}{x + 1} = \dfrac{(x+3)(x-1)}{x+1}$

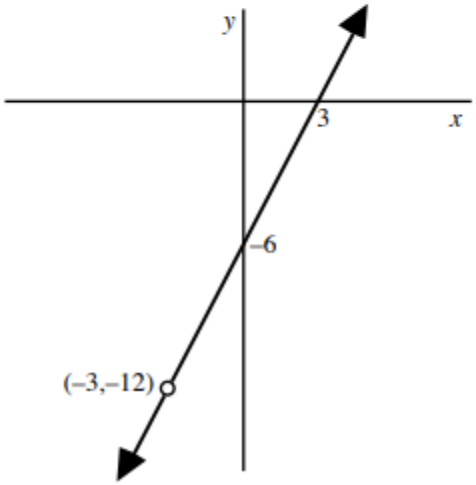
(a)



(b)



(c)



(d)