

Day #35 Homework

$f(x) = \frac{3x^2 - 6x}{x^2 - 4}$	$g(x) = \frac{x^2 - x - 20}{2x^2 - 10x}$	$h(x) = \frac{x^2 - 16}{x^2 - 6x + 8}$
1. What is $f(x)$ written in factored form?	6. What is $g(x)$ written in factored form?	11. What is $h(x)$ written in factored form?
2. Identify the restricted values of $f(x)$ .	7. Identify the restricted values of $g(x)$ .	12. Identify the restricted values of $h(x)$ .
3. What is the domain of $f(x)$ ?	8. What is the domain of $g(x)$ ?	13. What is the domain of $h(x)$ ?
4. What is/are the zero(s) of $f(x)$ ?	9. What is/are the zero(s) of $g(x)$ ?	14. What is/are the zero(s) of $h(x)$ ?
5. What is the $y$ – intercept of the graph of $f(x)$ ?	10. What is the $y$ – intercept of the graph of $g(x)$ ?	15. What is the $y$ – intercept of the graph of $h(x)$ ?

16. Given the rational function  $p(x) = \frac{(3x + 2)(x - 4)}{(x - 1)(x - 4)}$ , identify each of the following.

Restricted Values & Domain:	Zero(s):	Y – intercept:

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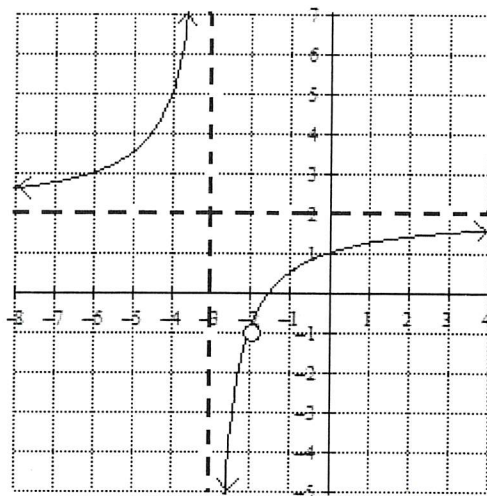
16. Given the rational function  $p(x) = \frac{(3x+2)(x-4)}{(x-1)(x-4)}$ , identify each of the following.

Restricted Values & Domain:	Zero(s):	Y – intercept:

Pictured to the right is the graph of a rational function,  $H(x)$ .

17. What factor(s) is/are guaranteed to be in the denominator of the equation of  $H(x)$ ? Explain your reasoning.

18. What factor(s) is/are guaranteed to be in the numerator of the function but not in the denominator of the function? Give a reason for your answer.



19. If  $c$  is the constant term of the numerator of  $H(x)$  and  $d$  is the constant term of the denominator of  $H(x)$ , what is the value of  $\frac{c}{d}$ ? Explain your reasoning.

20. What are the domain and range of  $H(x)$ ?

Domain: \_\_\_\_\_ Range: \_\_\_\_\_

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1. What is $f(x)$ written in factored form? $\frac{3x(x-2)}{(x+2)(x-2)}$	6. What is $g(x)$ written in factored form? $\frac{(x-5)(x+4)}{2x(x-5)}$	11. What is $h(x)$ written in factored form? $\frac{(x+4)(x-4)}{(x-4)(x-2)}$
2. Identify the restricted values of $f(x)$ . $x = -2$ and $2$	7. Identify the restricted values of $g(x)$ . $x = 0$ and $5$	12. Identify the restricted values of $g(x)$ . $x = 4$ and $2$
3. What is the domain of $f(x)$ ? $(-\infty, -2) \cup (-2, 2) \cup (2, \infty)$	8. What is the domain of $g(x)$ ? $(-\infty, 0) \cup (0, 5) \cup (5, \infty)$	13. What is the domain of $g(x)$ ? $(-\infty, 2) \cup (2, 4) \cup (4, \infty)$
4. What is/are the zero(s) of $f(x)$ ? $x = 0$	9. What is/are the zero(s) of $g(x)$ ? $x + 4 = 0$ $x = -4$	14. What is/are the zero(s) of $h(x)$ ? $x + 4 = 0$ $x = -4$
5. What is the $y$ -intercept of the graph of $f(x)$ ? $\frac{0}{4} = 0$ $(0, 0)$	10. What is the $y$ -intercept of the graph of $g(x)$ ? $\frac{-20}{0}$ undefined $g(x)$ does not have a $y$ -int	15. What is the $y$ -intercept of the graph of $f(x)$ ? $\frac{-16}{8} = -2$ $(0, -2)$

16. Given the rational function  $p(x) = \frac{(3x+2)(x-4)}{(x-1)(x-4)}$ , identify the domain, the zero(s), and the  $y$ -intercept of the graph of  $p(x)$ .

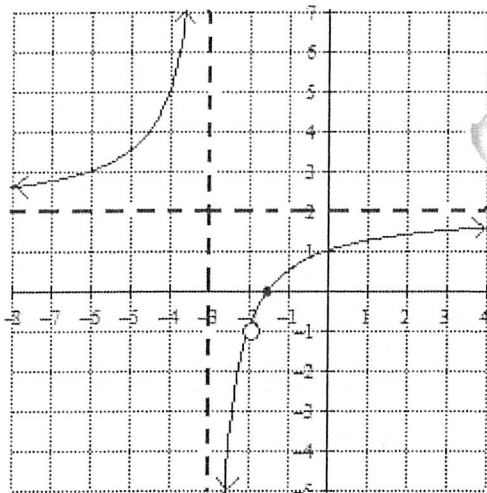
Domain:  $(-\infty, 1) \cup (1, 4) \cup (4, \infty)$

Zero(s):  $3x+2=0$   $x = -\frac{2}{3}$

$y$ -intercept:  $\frac{-8}{4} = -2$   $(0, -2)$



Pictured to the right is the graph of a rational function,  $H(x)$ .



17. What factor(s) is/are guaranteed to be in the denominator of the equation of  $H(x)$ ? Explain your reasoning.

Since  $H(x)$  is undefined at  $x = -3$  and  $x = -2$ , then  $(x+3)$  and  $(x+2)$  are guaranteed factors of the denominator.

18. What factor(s) is/are guaranteed to be in the numerator of the function but not in the denominator of the function? Give a reason for your answer.

Since  $H(x)$  has a zero at  $x = -1.5$ , then  $(2x+3)$  is guaranteed to be a factor in the numerator of  $H(x)$  but not in the denominator.

19. If  $c$  is the constant term of the numerator of  $H(x)$  and  $d$  is the constant term of the denominator of  $H(x)$ , what is the value of  $\frac{c}{d}$ ? Explain your reasoning.

Since  $H(x)$  has a  $y$ -intercept at  $(0, 1)$ , then  $\frac{c}{d} = 1$ .

20. What are the domain and range of  $H(x)$ ?

Domain:  $(-\infty, -3) \cup (-3, -2) \cup (-2, \infty)$  Range:  $(-\infty, -1) \cup (-1, 2) \cup (2, \infty)$