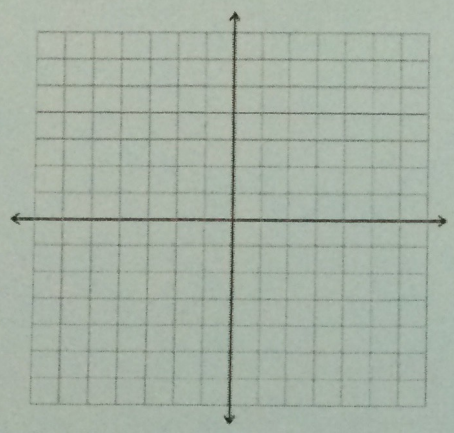
Secondary III
7-1 HW Rational Functions

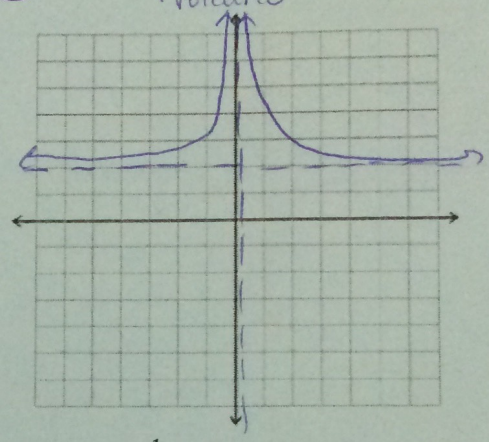
Name: Selected Answers
Period: A4 & B8

Graph the Following functions:

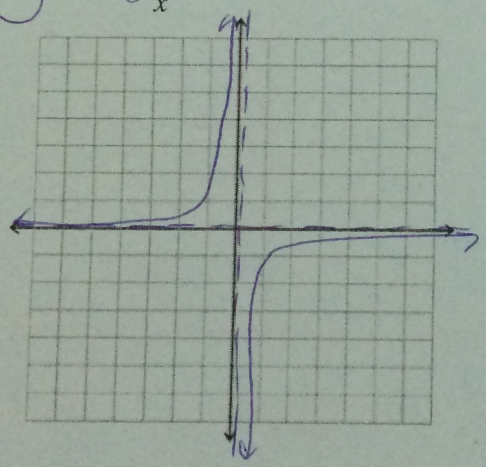
1. $f(x)=\frac{1}{x+2}$



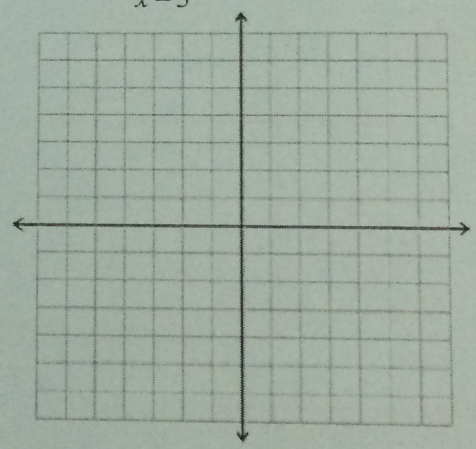
2. $g(x)=\frac{1}{x^2}+2$ up 2 volcano



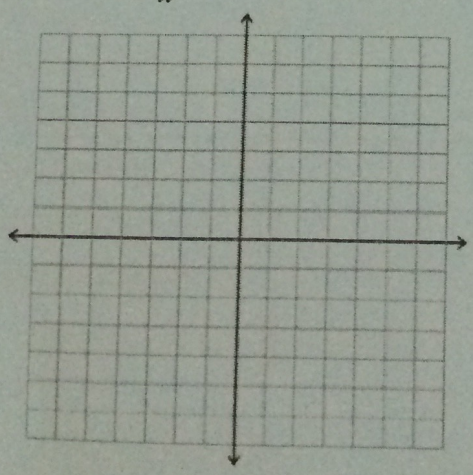
3. $h(x)=-\frac{1}{x}$ V. Flip



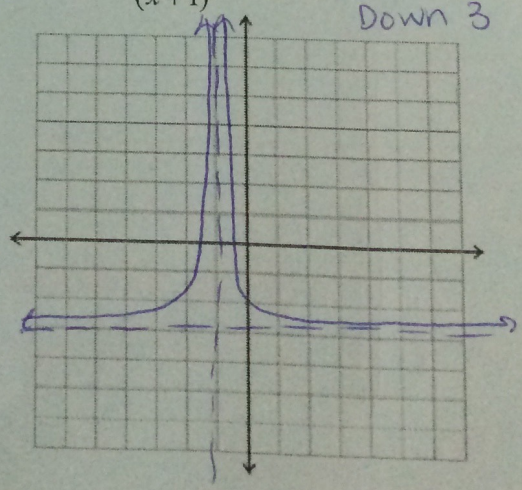
4. $p(x)=\frac{1}{x-3}+2$



5. $k(x)=-\frac{1}{x^2}$

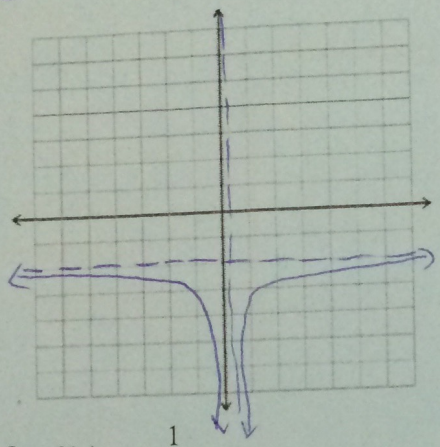


6. $f(x)=\frac{1}{(x+1)^2}-3$ Left 1 Down 3 V_Flip volcano



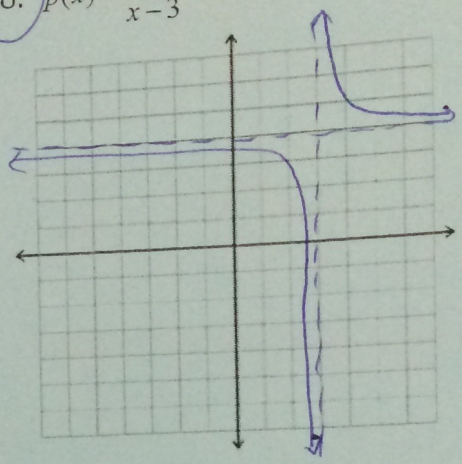
V. Flip
Down 2 volcano

7. $f(x) = -\frac{1}{x^2} - 2$

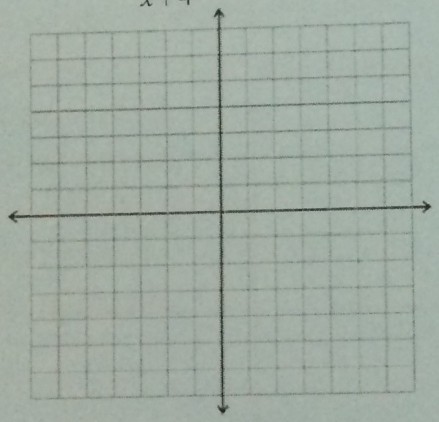


Right 3
Up 4

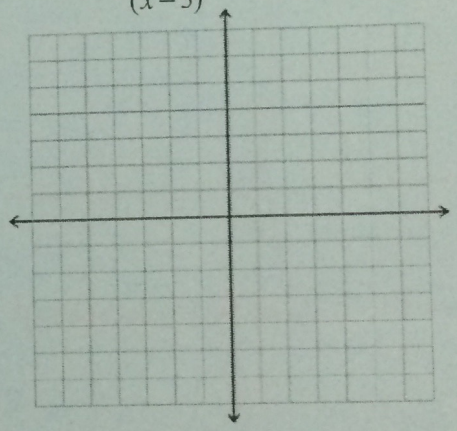
8. $p(x) = \frac{1}{x-3} + 4$



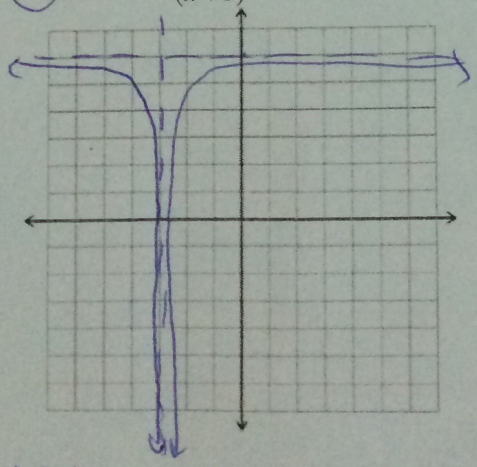
9. $f(x) = -\frac{1}{x+4}$



10. $g(x) = \frac{1}{(x-3)^2} - 5$

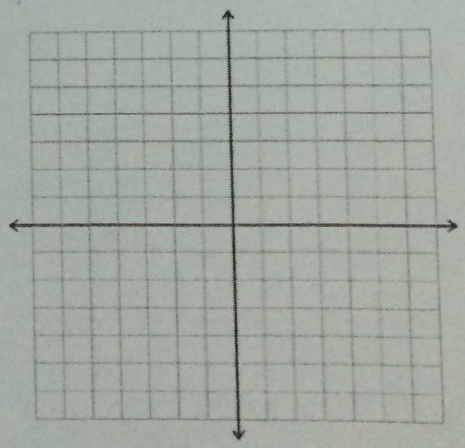


11. $k(x) = -\frac{1}{(x+3)^2} + 6$



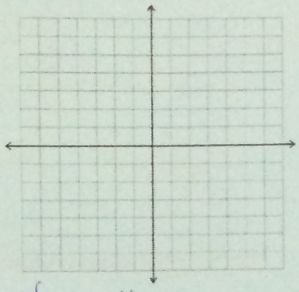
V Flip
· Left 3 volcano
· Up 6

12. $f(x) = -\frac{1}{x+2} - 3$



Rewrite the function in the form $f(x) = q(x) + \frac{r(x)}{d(x)}$, then write the transformations from its parent function and sketch a complete graph of f(x).

13. $f(x) = \frac{3x+1}{x-2}$

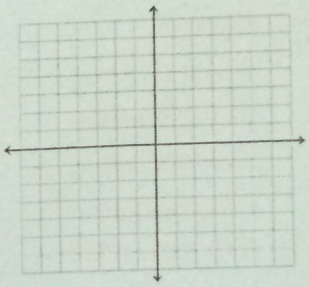


2| 3 1
↓ 6
3 | 7

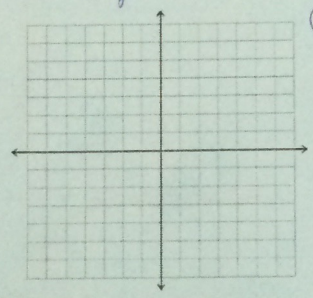
$\frac{7}{x-2} + 3$

Transformations:
- V. Stretch by 7
- Shift Up 3
- Shift Right 2

14. $g(x) = \frac{x+2}{x-1}$



15. $h(x) = \frac{x-1}{x+1}$



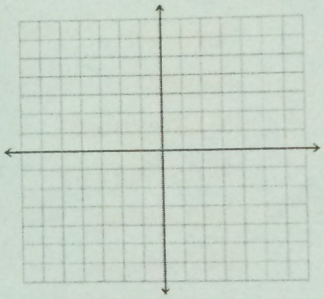
Skip

16. $j(x) = \frac{3x+6}{2x-4}$

$3/2$ R: 12
$2x-4 \overline{)3x+6}$
$-(3x-6)$
0 12

$\frac{12}{2x-4} + 3/2$

$= \frac{6}{(x-2)} + 3/2$



Transformations:
- V. Stretch by 6
- Shift Right 2
- Shift Up 3/2

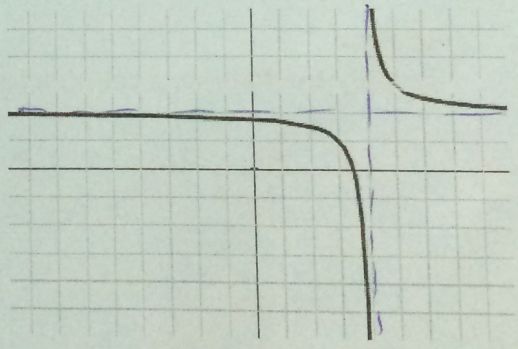
Give the function and analyze the following graphs:

17. $f(x) = \frac{1}{x-4} + 2$

Domain: $(-\infty, 4) \cup (4, \infty)$
Range: $(-\infty, 2) \cup (2, \infty)$
V Asymptote: $x = 4$
H Asymptote: $y = 2$
X-values
increasing: None
decreasing: $(-\infty, 4) \cup (4, \infty)$
End Behavior:

$\lim_{x \to -\infty} f(x) = 2$

$\lim_{x \to +\infty} f(x) = 2$



~~Asymptote behavior:~~

18. g(x)=

Domain:

Range:

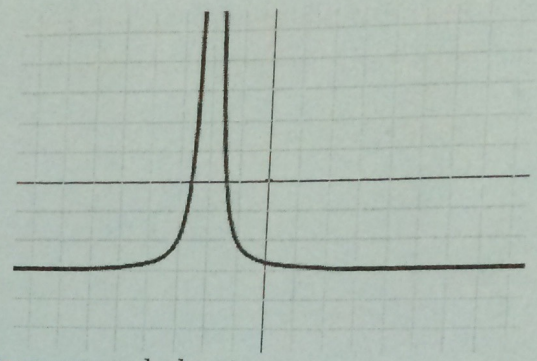
V Asymptote:

H Asymptote:

increasing:

decreasing:

End Behavior:



~~Asymptote behavior:~~

19. h(x)= $\frac{1}{x} - 3$

Domain: $(-\infty, 0) \cup (0, \infty)$

Range: $(-\infty, -3) \cup (-3, \infty)$

V Asymptote: $x = 0$

H Asymptote: $y = -3$

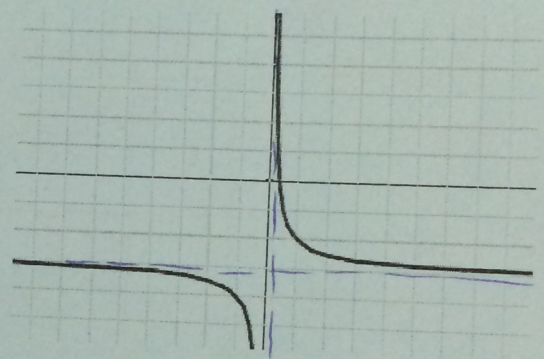
increasing: None

decreasing: $(-\infty, 0) \cup (0, \infty)$

End Behavior:

$\lim_{x \to -\infty} f(x) = -3$

$\lim_{x \to +\infty} f(x) = 3$



~~Asymptote behavior:~~

Review

Simplify the following rational expressions

1. $\frac{x^2-4}{2x^3} \cdot \frac{4x}{x^2-5x+6}$

2. $\frac{x^2+4x-12}{x^3-4x} \cdot \frac{3x-6}{x^2+x-2}$