Day 6 HW: Linear Over Linear Practice Selected Solutions

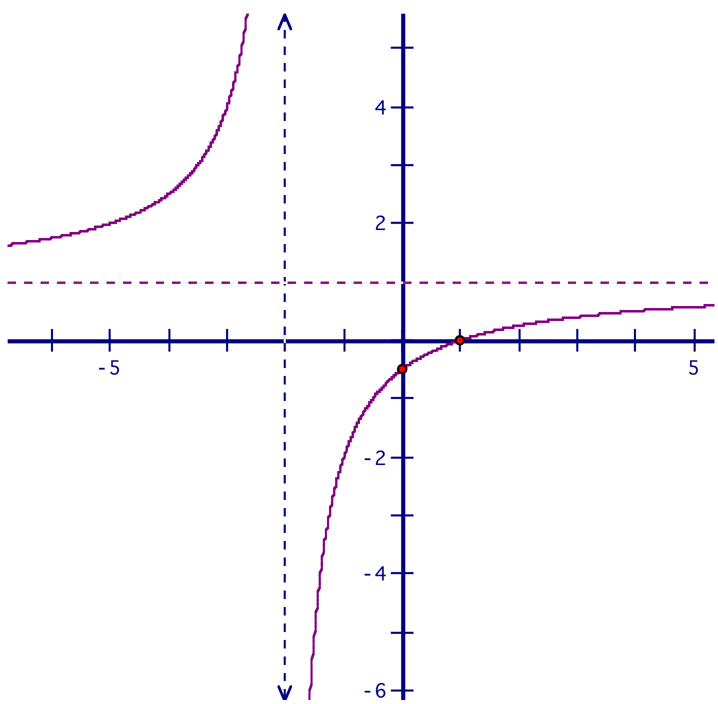
1a. (-b/a, 0). The zeros of a function are the *x-intercepts.* To find them we let $0 = \frac{ax+b}{cx+d}$.
A fraction is 0 only when the numerator is 0. So, to find the zeros we set the numerator to 0, meaning $ax + b = 0$. Solving for x gets us $x = -b/a$.

1b. *(0, b/d).* To find the *y-intercept* we set $x = 0$.

1c. $x = -d/c$. A vertical asymptote occurs at the x values that make the function undefined. To find these, we set the denominator equal to 0.

1d. $y = a/c$ Horizontal asymptotes describe the end behavior of the function. Thus, to find them we evaluate $\lim_{x\to\infty} f(x)$. In this case, since the degrees of the numerator and denominator are the same, the limit will be the ratio of the lead coefficients.

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



4. Consider $f(x) = \dfrac{2x+3}{3x-6}$

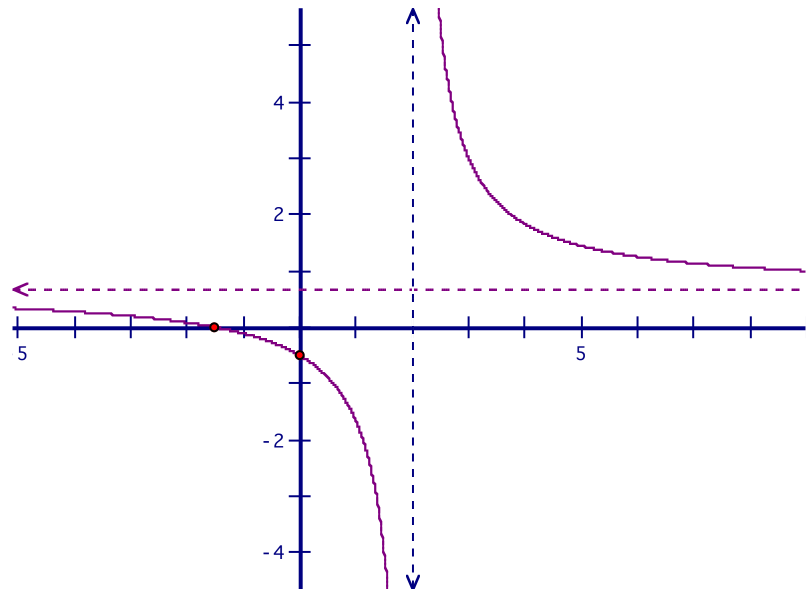
(a) (-1.5, 0)

(b) (0, -0.5)

(c) $x = 2$

(d) $y = 2/3$

(f) $f(-4) = 5/18$
$f(-2) = 1/12$
$f(6) = 1.25$



6. Vertical asymptotes occur when the denominator is 0. If the expression in the denominator were $x - a$ then the vertical asymptote would occur at $x = a$ because when $x = a$, the expression $x - a$ is equal to 0. However, this same result doesn't happen if the lead co-efficient is not 1.