Group #: _____ Name: _____

1. (15 points each) Use long division to divide $P(x)$ by $D(x)$, and express the quotient $P(x)/D(x)$ in the form
$$\frac{P(x)}{D(x)} = Q(x) + \frac{R(x)}{D(x)}.$$
   (a) $P(x) = x^3 + 6x + 5, \quad D(x) = x - 4$
   (b) $P(x) = 4x^2 - 3x - 7, \quad D(x) = 2x - 1$
   (c) $P(x) = 6x^3 + x^2 - 12x + 5, \quad D(x) = 3x - 4$
   (d) $P(x) = 2x^4 - x^3 + 9x^2, \quad D(x) = x^2 + 4$

2. Use transformations of the graph of $f(x) = \dfrac{1}{x}$ to **graph** the given rational function, $r(x)$, and **state the domain and range of** r.
   (a) (15 points) $r(x) = \dfrac{-2}{x-2}$
   (b) (15 points) $r(x) = \dfrac{3x-3}{x+2}$
   (c) (10 points) $r(x) = \dfrac{2x-9}{x-4}$