Parent Functions #2

Original Function #1: $y = \frac{1}{x}$

Original Function #2:

$$y = x^5 + 8x^4 - 11x^3 - 142x^2 - 80x + 224$$

Original Function #3: $y = \sqrt[3]{x}$

Original Function #4: $y = 3x^3 - 11x^2 - 62x + 120$

- Adjustment A: $f(-x)$
- Adjustment B: $-f(x)$
- Adjustment C: $f(x+5)$
- Adjustment D: $f(x-3)$
- Adjustment E: $f(2x)$
- Adjustment F: $3f(x)$
- Adjustment G: $f(x)+4$
- Adjustment H: $f(x)-7$

Directions:

- Using Maple as a guide, hand draw 32 graphs on graph paper
- You use 8 pages to complete this assignment
- Each page will contain 4 graphs
- Each page will center on one of the 8 function adjustments above
- On each of the four graphs you will include two functions, the original and the adjusted function which is the center of that page
- For each function you graph (8 per page), you must list all x-intercepts and y-intercepts
- For each graph, use at least three points to embelish the validity of the scales of the x and y axes
- All x-intercepts and y-intercepts must be shown
- All infinite behavior must be demonstrated

Useful Maple:

Assuming we have two functions, f & g, in terms of x

- To plot a function:
  $plot(f, x = -10..5, y = -20..50, discont = true, color = red)$
- To plot two functions:
  $plot([f, g], x = -10..5, y = -20..50, discont = true, color = [red, blue])$
- To find the zeroes of a function: $solve(f = 0, x)$
- To find the y-intercept of a function: $subs(x = 0, f)$
- To turn an exact number (a) into a decimal: $evalf(a)$
- To input a random variable into a function (defined for x):
  $subs\left(x = t + \frac{a}{3}, f\right)$