

Homework 07-11

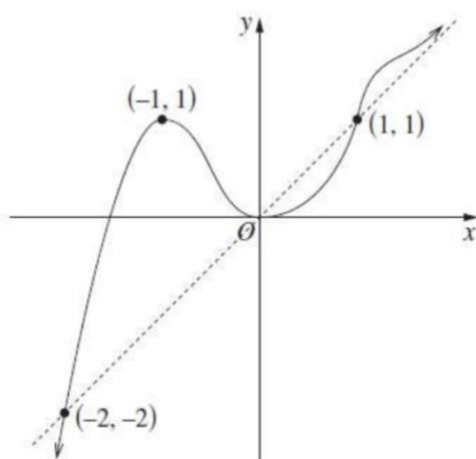
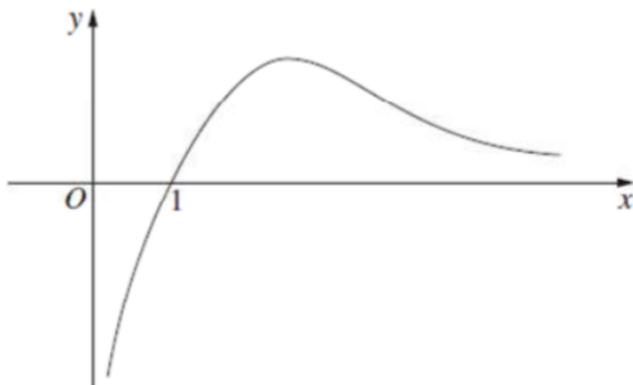
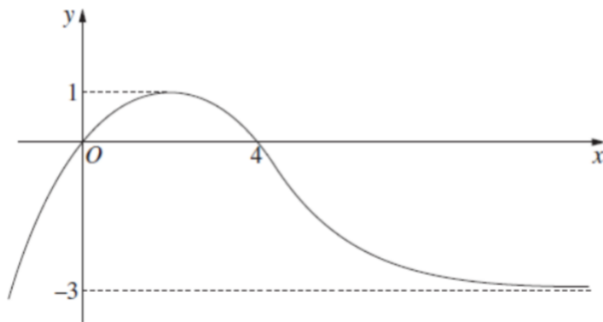
2U: Graphing Techniques

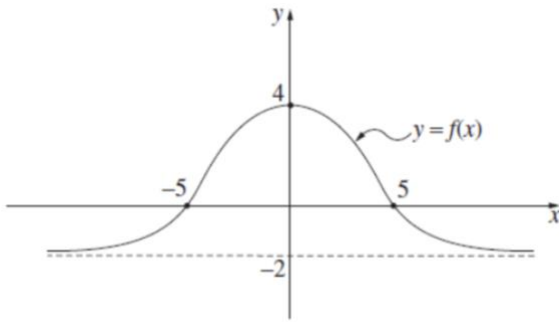
1. Below are a series of graphs, representing $f(x)$. For each graph, graph the following transformations; keep in mind any transformations that don't commute!!:

a. $y = 5 - 2f(6 - 2x)$

b. $y = 3f(3x) - 3$

c. $y = \frac{1}{2}f\left(\frac{1}{2} - \frac{x}{2}\right)$





2. Answer the below question.

Let $f(x) = \ln(1+x) - \ln(1-x)$ where $-1 < x < 1$.

- (i) Show that $f'(x) > 0$ for $-1 < x < 1$.
- (ii) On the same diagram sketch
- $$y = \ln(1+x) \quad \text{for } x > -1$$
- $$y = \ln(1-x) \quad \text{for } x < 1$$
- and $y = f(x) \quad \text{for } -1 < x < 1$

Clearly label the three graphs.

3. Graph the following functions. Hint: the 'largest' variable is x on the top and bottom... it's a hyperbola in disguise...

- a. $y = \frac{3x+2}{x-1}$
- b. $y = \frac{4x-3}{x+2}$
- c. $y = \frac{2x-6}{x+3}$

4. The below question involves graphs that may (or may not) have asymptotes...

- a. $y = \frac{3x^2+4}{x^2-5}$
- b. $y = \frac{6x^2-3}{x^2+1}$

5. For the below functions, describe the transformations required to go from $f(x)$ to $g(x)$:

- a. $f(x) = 4 \ln(2x+3)$ to $g(x) = -2 + \ln(5-x)$.
- b. $f(x) = 2 \ln(x-1)$ to $g(x) = 4 - \ln(2x+5)$.
- c. $f(x) = 2\sqrt{x+3}$ to $g(x) = -4\sqrt{x-1} + 5$.

d. $f(x) = x^2 + 1$ to $g(x) = -2(x - 3)^2 + 4$.