Exam 2B: Part 1

MATH 1110, FALL 2017

NAME:

You can use a calculator on this part of the exam.

1. (16 points) Define the function $f(x) = -3x^2 + 7x + 5$.
   (a) Evaluate $f(6.5)$.

   (b) Solve $f(x) = 0$. Show the formula that you use to get your answer.

   (c) Solve $f(x) = 10$

2. (24 points) A rocket is launched at time $t = 0$. Its height above the ground is given by the equation

$$y(t) = -5t^2 + 184t + 1500,$$

where y is height (in meters) and t is time (in seconds).

(a) How high is the rocket at the time it is launched?

(b) How high is the rocket after 15 seconds?

(c) What is the maximum height of the rocket? Show the formula that you use to find your answer.

(d) At what time does the rocket hit the ground?

Exam 2B: Part 2

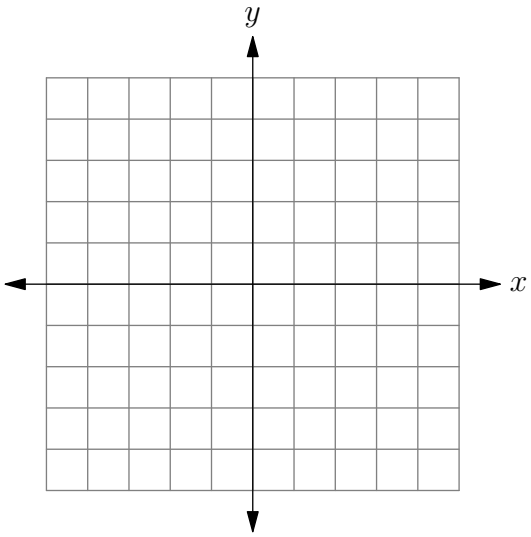
MATH 1110, FALL 2017

NAME:

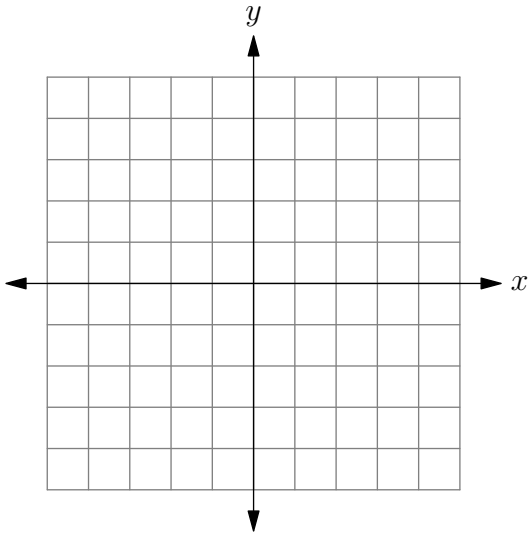
No calculators on this part of the exam.

4. (12 points) Graph each of the functions. Your graph should show the correct shape and the coordinates of two or three important points.

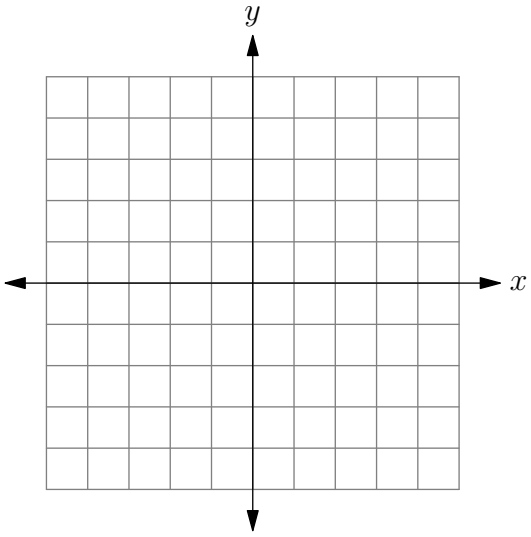
(a) $f(x) = x^3$



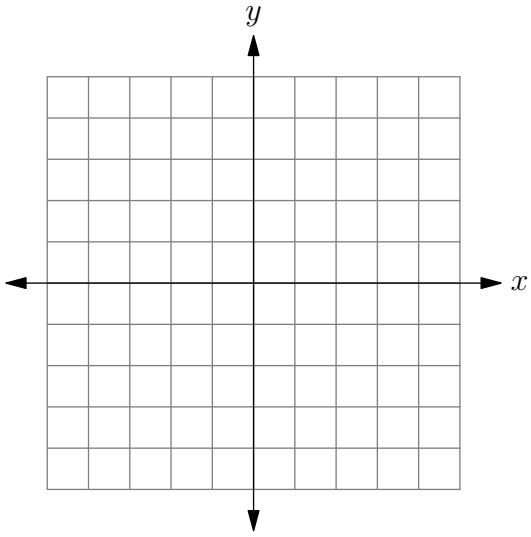
(b) $f(x) = x^4 - \frac{7}{3}$



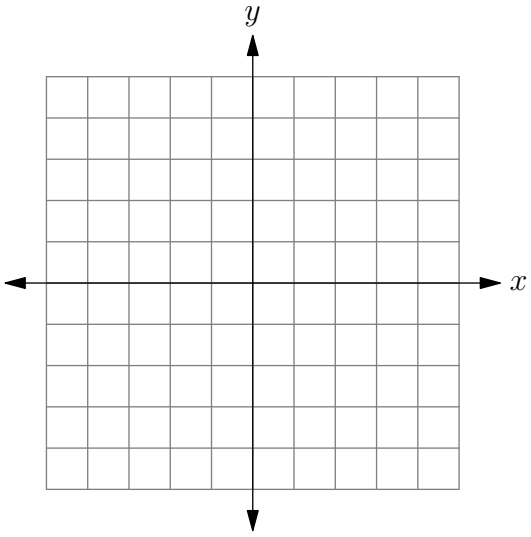
(c) $f(x) = x^{-3}$



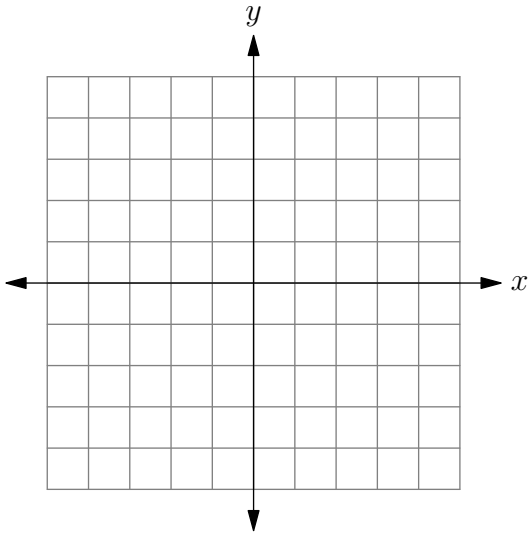
(d) $f(x) = (1-x)^{-3}$



(e) $f(x) = x^{1/3}$



(f) $f(x) = x^{1/4}$



5. (3 points) Define the piecewise function

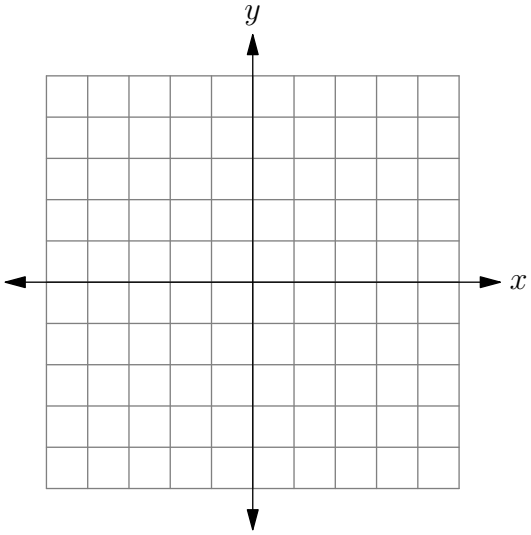
$$g(x) = \begin{cases} 3x^2 - 1 & \text{if } x < 2 \\ 5 - x & \text{if } x \geq 2 \end{cases}$$

(a) Evaluate $g(0)$.

(b) Evaluate $g(5)$.

6. (10 points) Let $y = -2x^2 + 4x + 2$.

   (a) Graph the parabola.



   (b) Give the coordinates of the vertex.

7. (10 points) Find $(4x^3 - 3x^2 - 8x + 4) \div (x - 2)$.

8. (3 points) Give a polynomial function that has zeros -11, -4, 0, and 3.

9. (22 points) Consider the polynomial function $f(x) = x^3 + 4x^2 - 4x - 16$.

(a) Give the degree and leading term.

(b) Factor completely and give all of the zeros.

(c) Sketch a graph of the function.