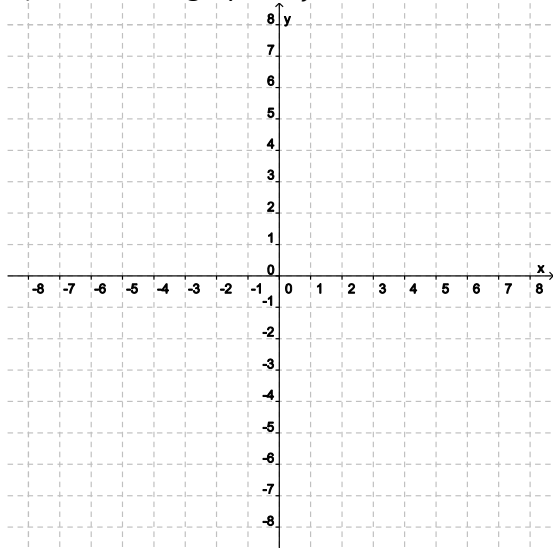


1. Let $f(x) = -x^2 + 6x - 7$.
a) Express f in standard form.

- b) Sketch the graph of f .



- c) Find the maximum or minimum value of f .

- d) Find the range of f .

2. A graduation cap is thrown up with a velocity of 20 ft/s. Its height after t seconds is given by $y = 20t - 16t^2$ (in feet). What is the maximum height attained by the cap?

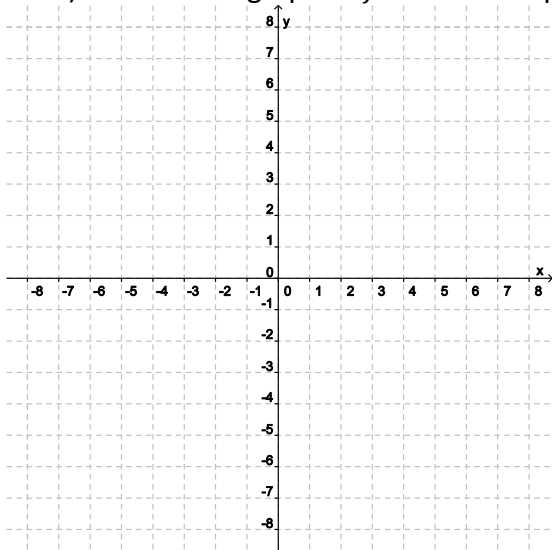


3. Let $f(x) = 4x^2 - 8x + 3$.

a) Express f in standard form.

b) Find the vertex of f .

c) Sketch the graph of f . Be sure to plot the vertex and y -intercept.



d) Find the maximum or minimum value of f .

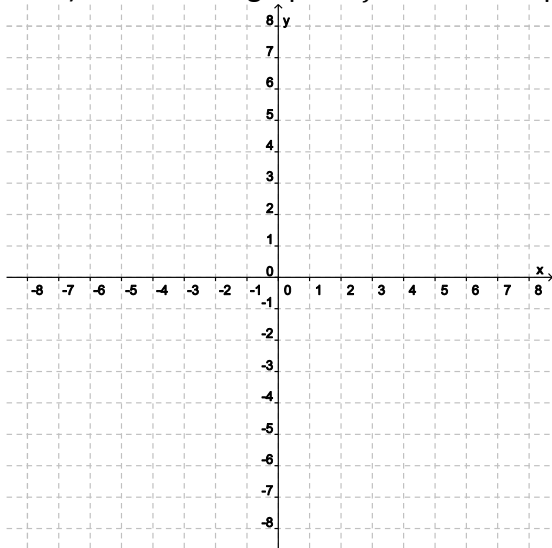
e) Find the range of f .

4. Let $f(x) = 2x^2 - 6x$.

a) Express f in standard form.

b) Find the vertex of f .

c) Sketch the graph of f . Be sure to plot the vertex and y -intercept.



d) Find the maximum or minimum value of f .

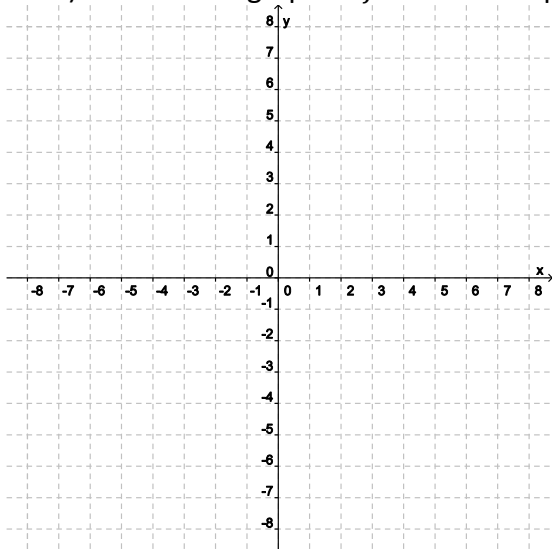
e) Find the range of f .

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

a) Express f in standard form.

b) Find the vertex of f .

c) Sketch the graph of f . Be sure to plot the vertex and y -intercept.



d) Find the maximum or minimum value of f .

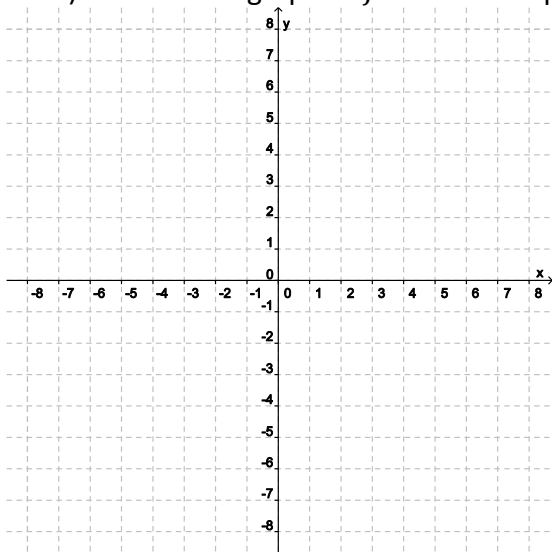
e) Find the range of f .

6. Let $f(x) = -2x^2 + 4x + 5$.

a) Express f in standard form.

b) Find the vertex of f .

c) Sketch the graph of f . Be sure to plot the vertex and y -intercept.



d) Find the maximum or minimum value of f .

e) Find the range of f .

7. Let $f(x) = 3x^2 + 9x - 2$.

a) Find the vertex of f .

b) Find the maximum or minimum value of f .

c) Find the range of f .

8. Let $f(x) = -7x^2 - 2x$.

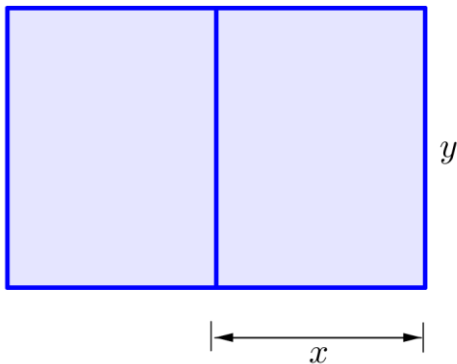
a) Find the vertex of f .

b) Find the maximum or minimum value of f .

c) Find the range of f .

9. You have 300 ft of fencing, and would like to fence off a rectangular plot of land next to a straight river. Assuming you don't need to fence off the side next to the river, find the dimensions that would maximize the area of your plot of land. What would the maximum area be?

10. A rectangular plot of land is going to be divided into two adjacent playgrounds (see diagram). If the total number of feet of fencing is 200, find the maximum total area enclosed by both playgrounds. (Note: there is only one fence between the playgrounds, not two.)



11. A Precalculus book is thrown up and off the top of a 100-foot building (don't get any ideas!). The height of the book t seconds after throwing it is given by the function $h(t) = 100 + 64t - 16t^2$ (in feet). What is maximum height attained by the book? When does this happen?
12. A jumping robot jumps up. The height of the robot t seconds after jumping is given by the function $y(t) = 98t - 4.9t^2$ (in meters). What is maximum height attained by the robot? When does this happen?

Optional exercises from the Sullivan book if you'd like more practice:

3.3 (p.145) #13-29 odd, 33-47 odd (parts a and b only, don't find axis of symmetry), 55-61 odd
3.4 (p.153) #7, 9, 11abcf, 16