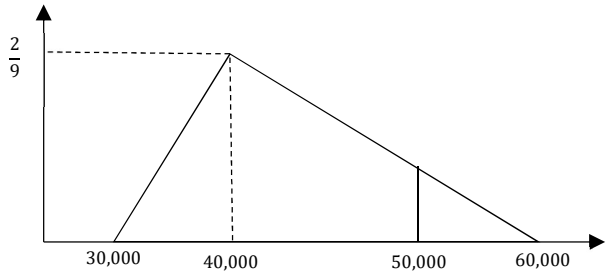
Part 4.2: The Right Slope

The right slope is very similar to the left slope, but it is the part coming down on the right hand side. The formula for this section is $\frac{2(b-x)}{(b-a)(b-c)}$. Let's look at another example:

Example
A company knows that the cost of a project is going to be between \$30,000 and \$60,000 with the most likely cost being \$40,000.

a. What is the probability that the project costs more than \$50,000?
b. What is the probability that the project costs less than \$50,000?

Answer
The first thing we need to do is draw a diagram and fill in the values.
a = 30,000 (minimum)
b = 60,000 (maximum)
c = 40,000 (most likely)
x = 50,000 (the point we are looking at)



a. The area of a triangle is $\frac{1}{2} \times \text{base} \times \text{height}$
The base is the difference between 50,000 and 60,000 which is 10,000
Height = $\frac{2(b-x)}{(b-a)(b-c)}$
$= \frac{2(60{,}000-50{,}000)}{(60{,}000-3\ ,000)(60{,}000-4\ ,000)}$
$= \frac{20{,}000}{600{,}000{,}000} = \frac{1}{30{,}000}$
So probability = $\frac{1}{2} \times 10{,}000 \times \frac{1}{30{,}000} = \frac{1}{6}$

b. The probability that it is **less** than \$50,000 is just 1 minus the probability that it is **more** than \$50,000 so this is $1 - \frac{1}{6} = \frac{5}{6}$

Exercise 4.2

1. The time taken for the kettle to boil is between 1.5 minutes and 3 minutes. The most likely time is 2 minutes. What is the probability the kettle takes:
    a. More than 2.5 minutes to boil?
    b. Less than 2.5 minutes to boil?
    c. More than 2 minutes to boil?
    d. More than 2 minutes 15 seconds to boil?
2. A business knows that it will have a tax bill between \$3 million and \$8 million next year, with the most likely tax bill being \$4 million. What is the probability the tax bill will be:
    a. More than \$5 million?
    b. Less than \$6 million?
    c. More than \$7.5 million?
    d. Less than \$7 million?
3. The minimum time it takes to milk a cow is 4 minutes and the maximum time is 6 minutes. The most common time is 4.5 minutes. What is the probability the milking takes:
    a. More than 5 minutes?
    b. Less than 5.5 minutes?
    c. More than 4.5 minutes?
    d. Less than 6 minutes?
4. The amount of time that employees at a business spend in meetings a year is between 300 and 600 hours, with the most common time of 400 hours. What is the probability employees spend:
    a. More than 500 hours in meetings?
    b. Less than 550 hours in meetings?
    c. More than 600 hours in meetings?
    d. Less than 400 hours in meetings?