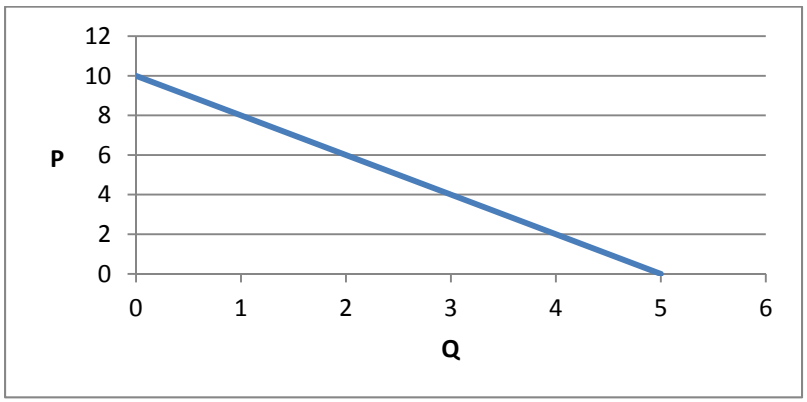
ECONOMICS 1A: PROBLEM SET 1 ANSWERS

Review of Graphs and Formulas

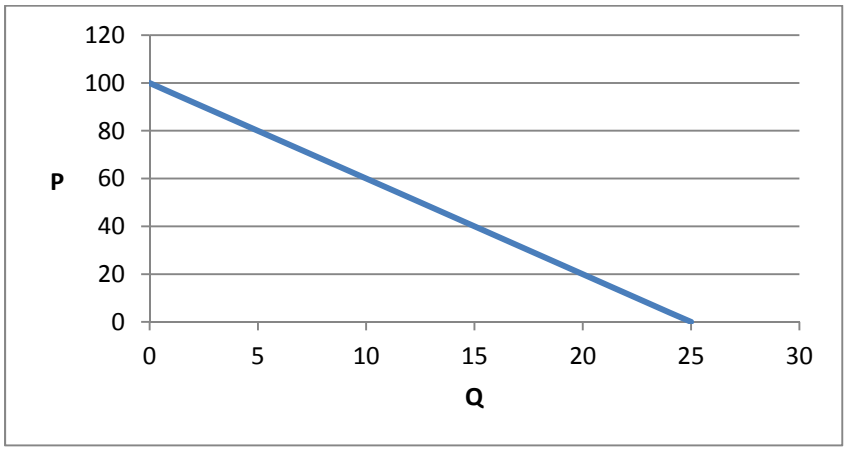
1. For each of the following equations, graph the line and calculate its slope (for both P and Q greater than or equal to 0).

a. P = 10 - 2Q (put Q on the X axis)



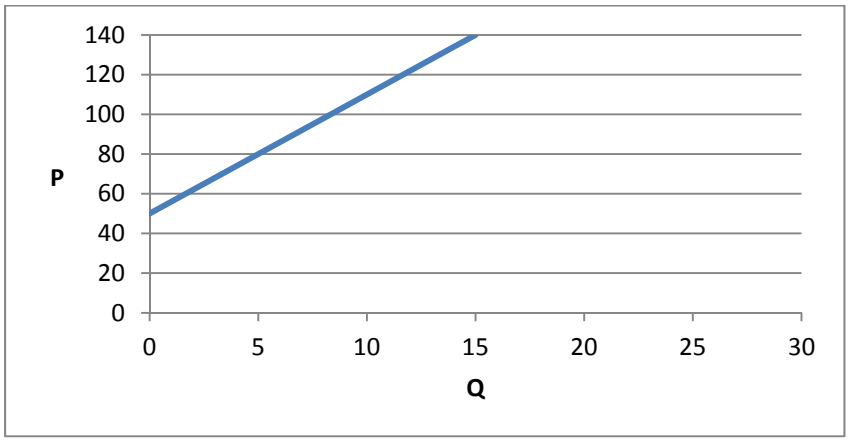
Slope = -2

b. P = 100 - 4Q (put Q on the X axis)



Slope = -4

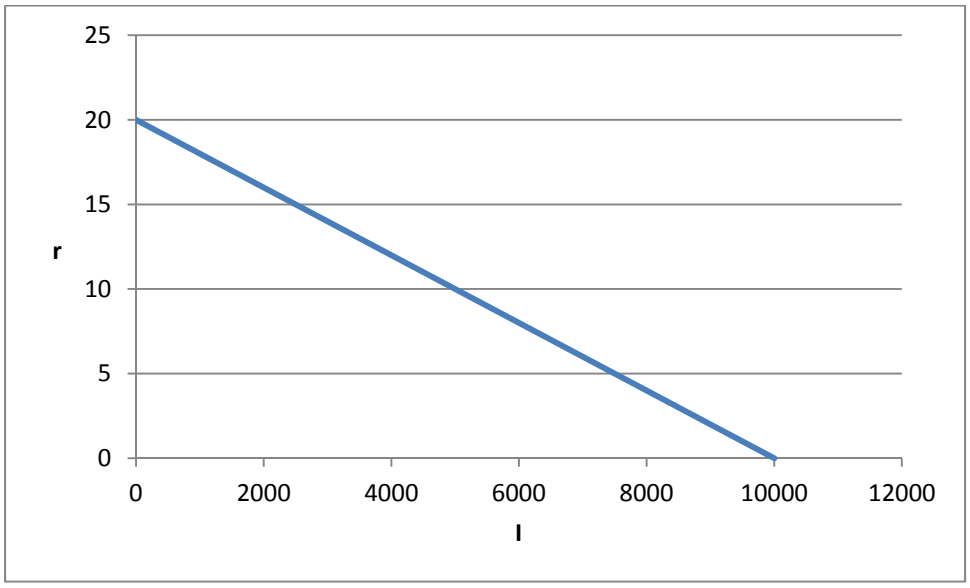
c. P = 50 + 6Q (put Q on the X axis)



Slope = +6

d. I = 10,000 - 500r (put I on the X axis)

I = 10, 000 – 500r → r = 20 – I/500



slope = -.002

2. Calculate the area under the lines in 1a, 1b and 1c from Q = 0 to Q = 5.

(a) $P = 10 - 2Q$

Area = ½ × 10 × 5 = 25

(b) $P = 100 - 4Q$

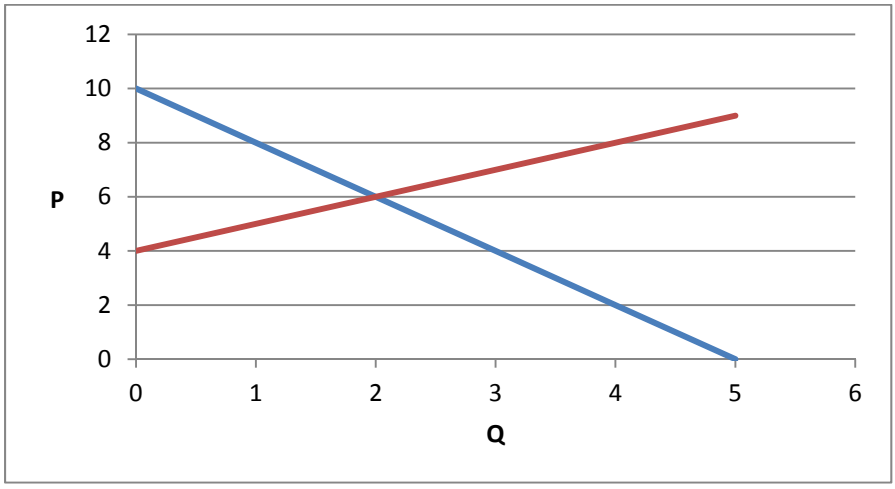
Area = ½ × 5 × 20 + 5 × 80 = 450

(c) $P = 50 + 6Q$

Area = ½ × 5 × 30 + 5 × 50 = 325

3. Graph the following equations (with Q on the X axis) and calculate where the lines intersect.

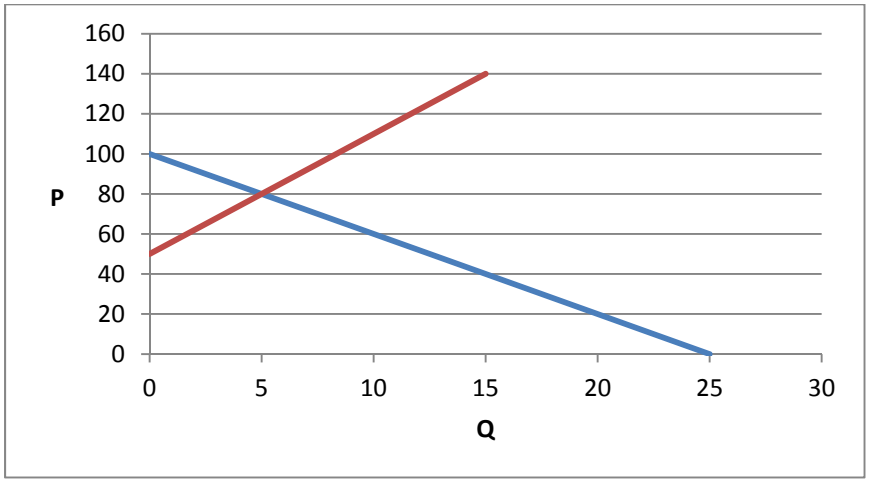
a. $P = 10 - 2Q$, $P = 4 + Q$



Intersection Q* = 2, P* = 6

[Analytical - $P = 10 - 2Q = 10 - 2(P-4) = 18 - 2P \rightarrow 3P = 18 \rightarrow P^* = 6, Q^* = 2$]

b P = 100 - 4Q, P = 50 + 6Q



Intersection Q* = 5, P* = 80

4. Calculate the area between the two curves and the vertical axis in 3a and 3b

a. Area = ½ × 2 × (10-4) = 6

b. Area = ½ × 5 × (100-50) = 125