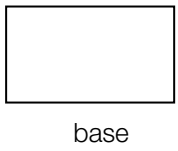
MATHS FOR PRICES & MARKETS:

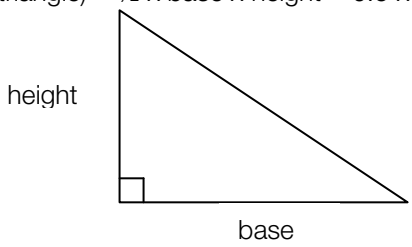
AREAS OF GRAPHICAL REGIONS

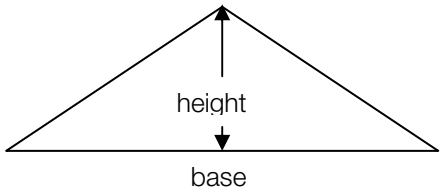
The area of all regions formed by graphing the equations of straight lines can be found using the formulae:

Area (rectangle) = base x height



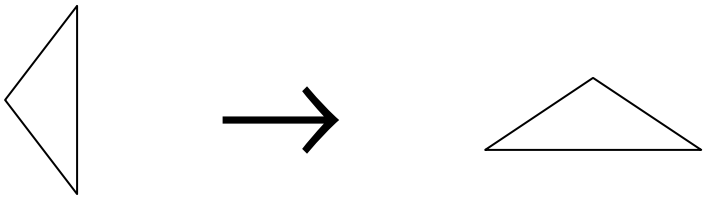
Area (triangle) = ½ x base x height = 0.5 x base x height





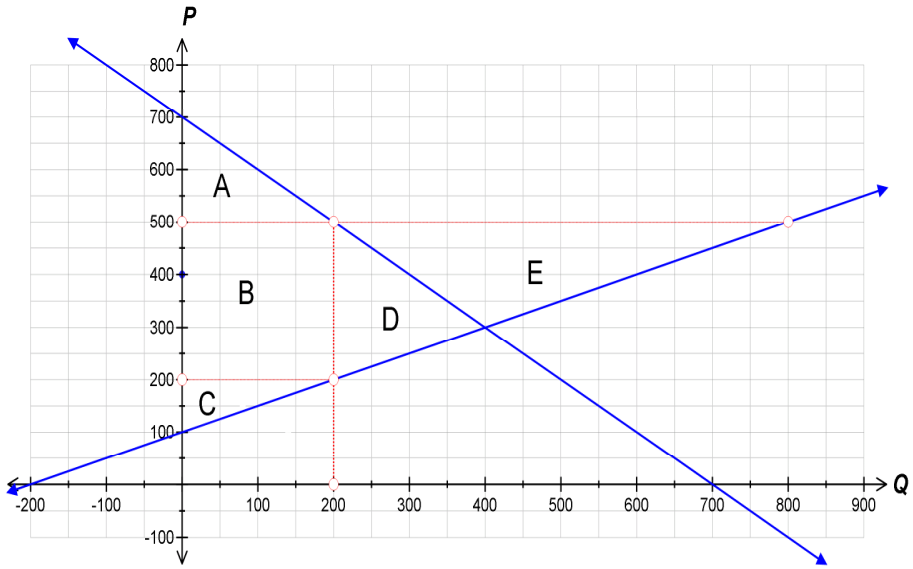
NB: The height of the triangle must always be measured at right angles to the base

Sometimes it is easier to see the base and the height of a triangle if you imagine it turned around:



Examples

1)



To find the area of **region A**:

Base = 200 – 0 = 200
Height = 700 – 500 = 200

∴ Area (Region A) = 0.5 x base x height
= 0.5 x 200 x 200
= 20000

To find the area of **region B**:

Base = 200- 0 = 200
Height = 500 – 200 = 300

∴ Area (Region B) = base x height
= 200 x 300
= 60000

To find the area of **region C**:

Base = 200- 0 = 200
Height = 200 – 100 = 100

∴ Area (Region B) = 0.5 x base x height
= 0.5 x 200 x 100
= 10000

To find the area of **region D**:

Base = 500 – 200 = 300 [using the red line as the base]
Height = 400 – 200 = 200

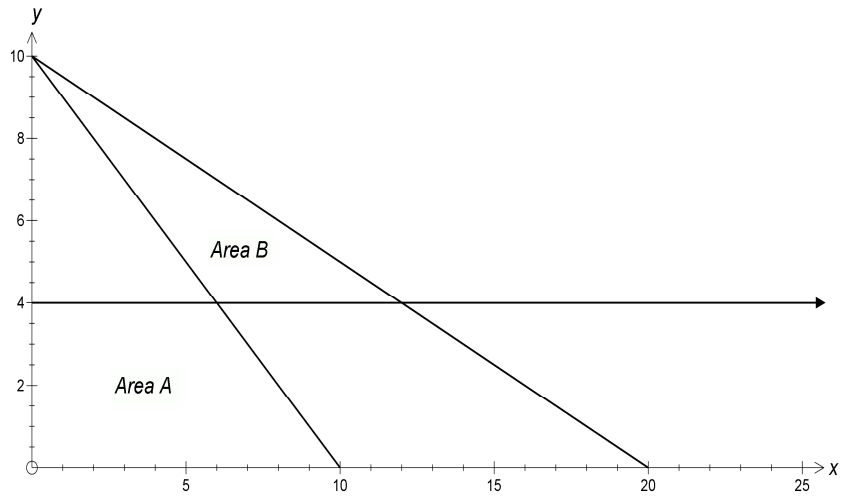
∴ Area (Region A) = 0.5 x base x height
= 0.5 x 300 x 200
= 30000

To find the area of **region E**:

Base = 800- 200 = 600
Height = 500 – 300 = 200

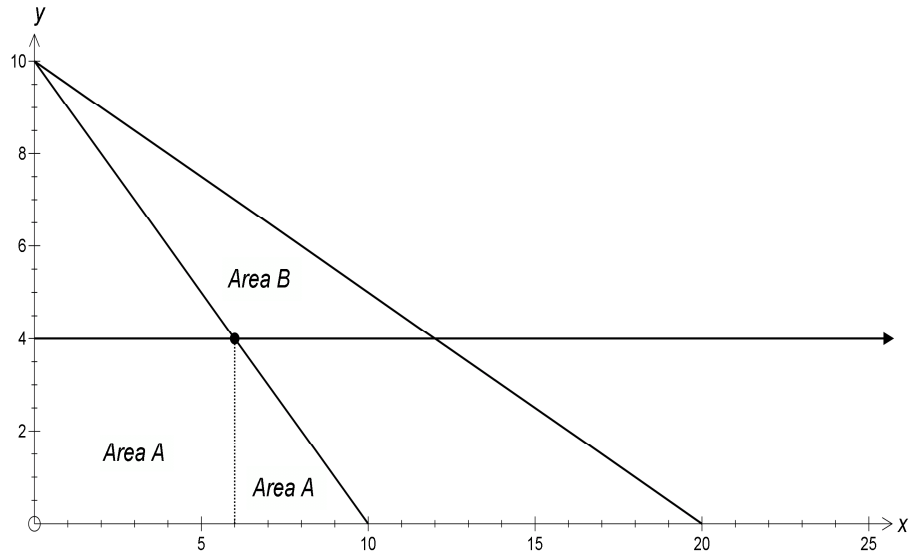
∴ Area (Region B) = 0.5 x base x height
= 0.5 x 600 x 200
= 60000

2) Find the area of the region A and region B in the following diagram



2.

To find the area of region A we must subdivide it into triangles and rectangles:



Area of **region A**:

Rectangle: Base = 6
Height = 4
Area (Rectangle A) = base x height
= 6 x 4
= 24

Triangle: Base = 10 – 6 = 4
Height = 4
Area (Triangle A) = 0.5 x base x height
= 0.5 x 4 x 4
= 8

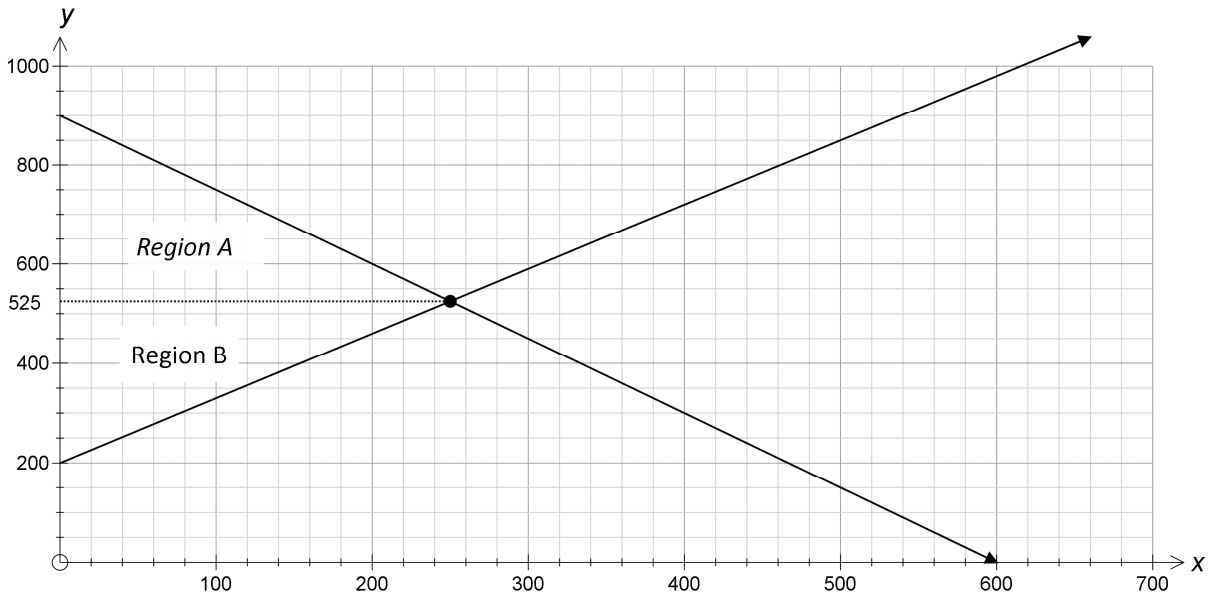
Total area region A = 24 + 8 = 32

Area of **region B**:

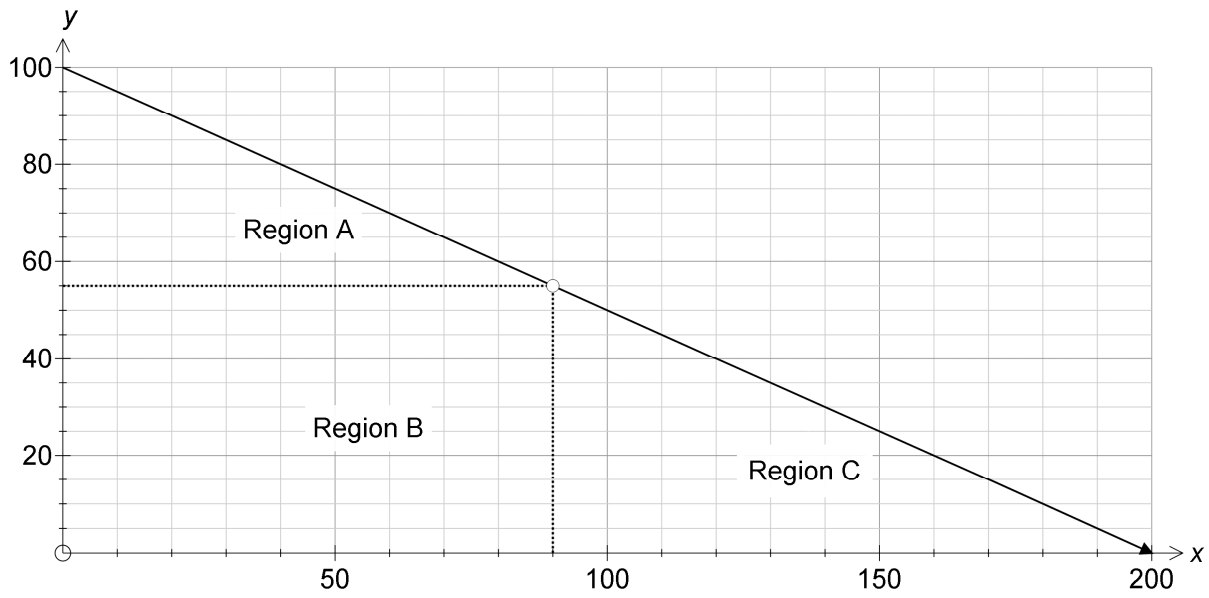
Base = 12 – 6 = 6
Height = 10 – 4 = 6
Area (Region B) = 0.5 x base x height
= 0.5 x 6 x 6
= 18

Exercise

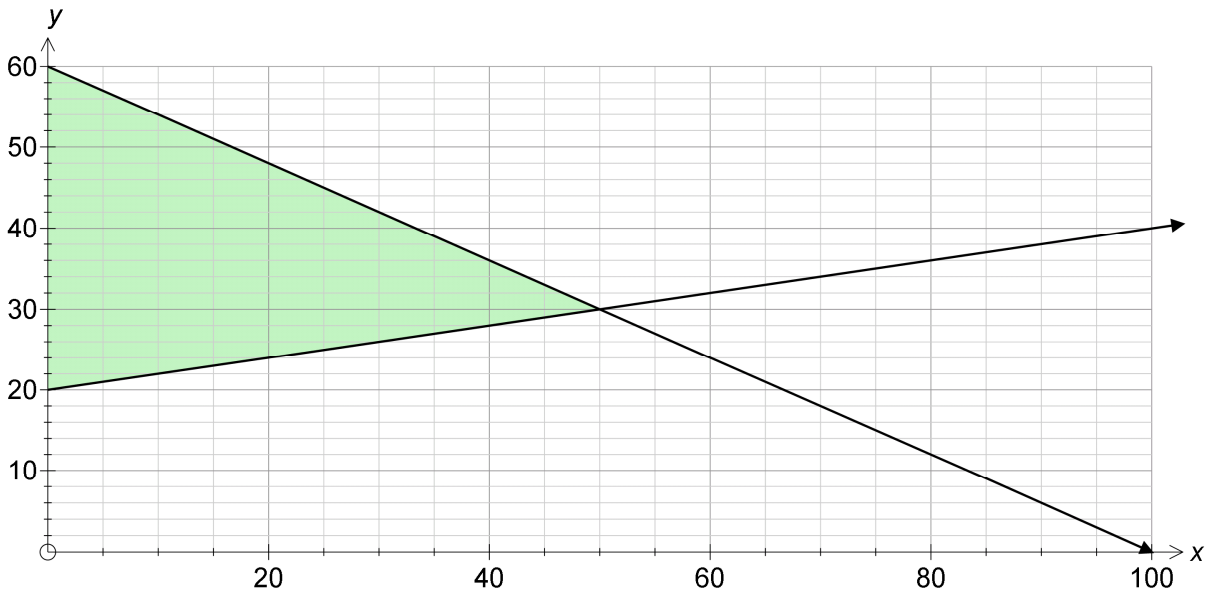
1. Find the areas of regions A and B



2. Find the areas of region A, region B and region C.



3. Find the area of the shaded region



Answers

1. Area Region A = 46875, Area Region B = 40625
2. Area Region A = 2025, Area Region B = 4950, Area Region C = 3025
3. Area = 1000