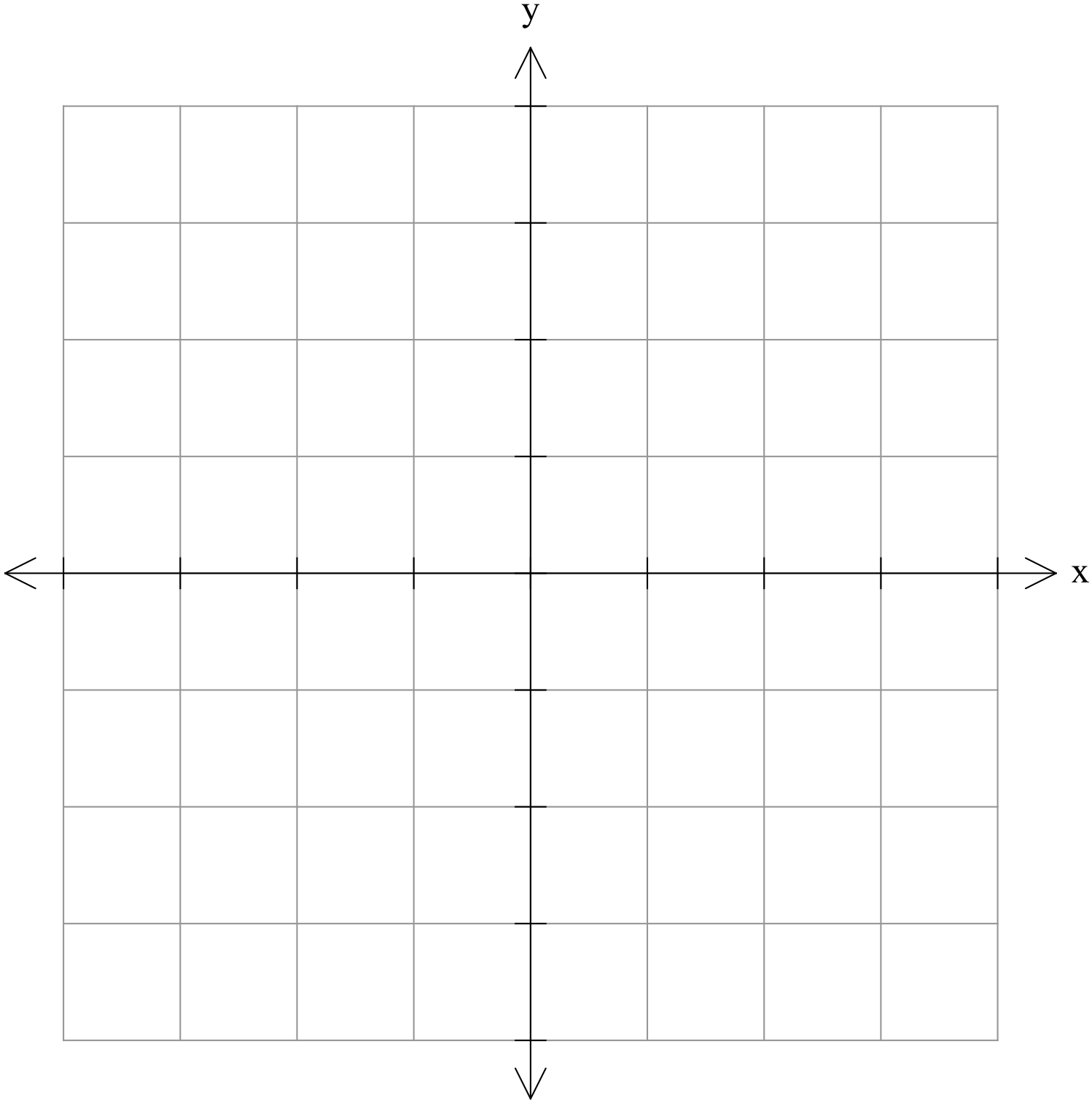
**Investigating Graphs – Part A**

In previous work you learnt that the graph of has the same shape as that of but has been translated horizontally *b* units and translated vertically *c* units. The effect of the dilation factor, *a*,is to stretch or compress the curve depending on the value of *a.* Furthermore, if *a* was negative, the graph was inverted.

The aim of this investigation is to investigate translations and dilations in other functions.

### [2 marks]

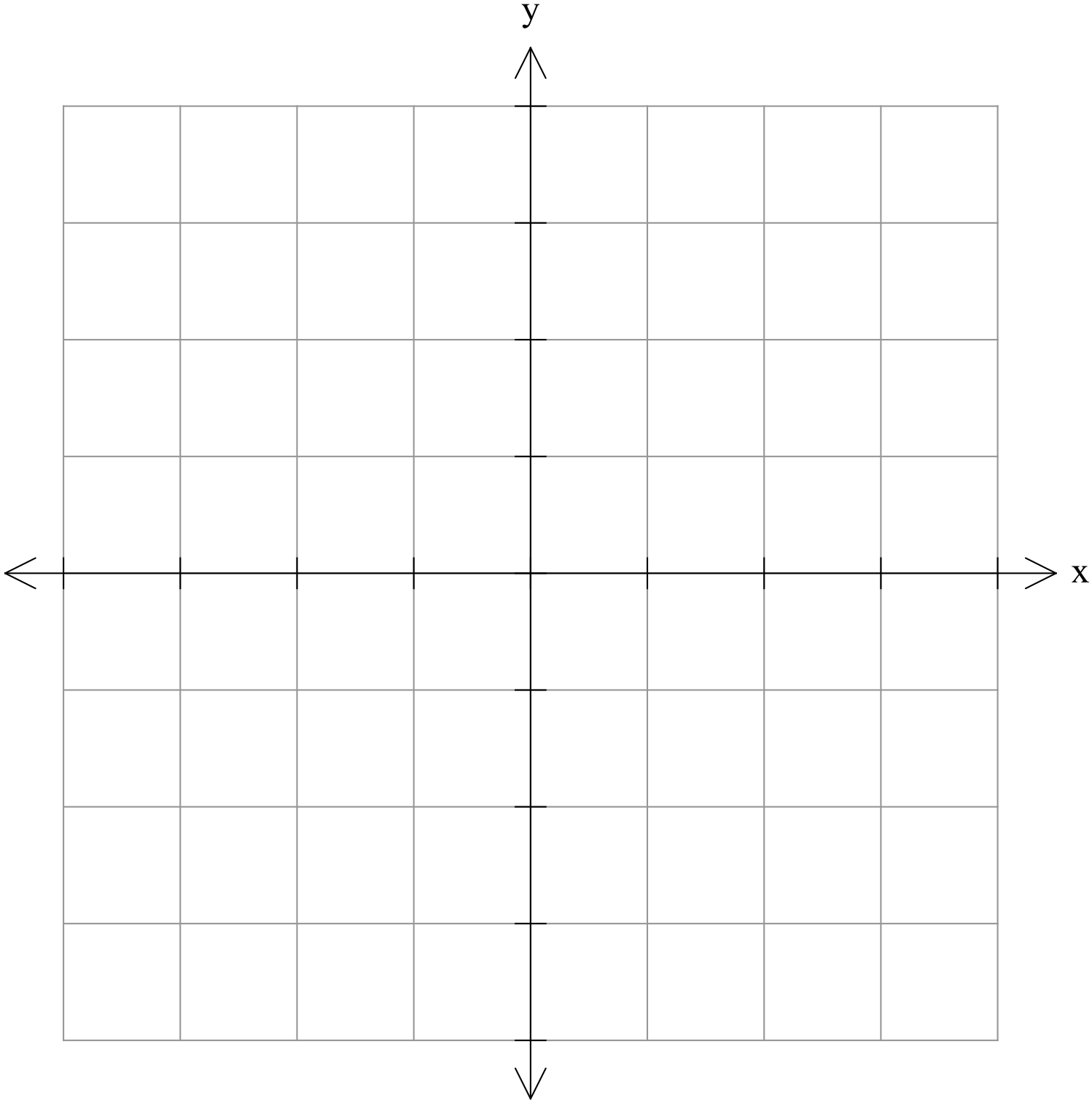
On the axes below, accurately graph the following function: .



### [5 marks]

On the following axes, labelling everything clearly, graph the following functions:

and



### [4 marks]

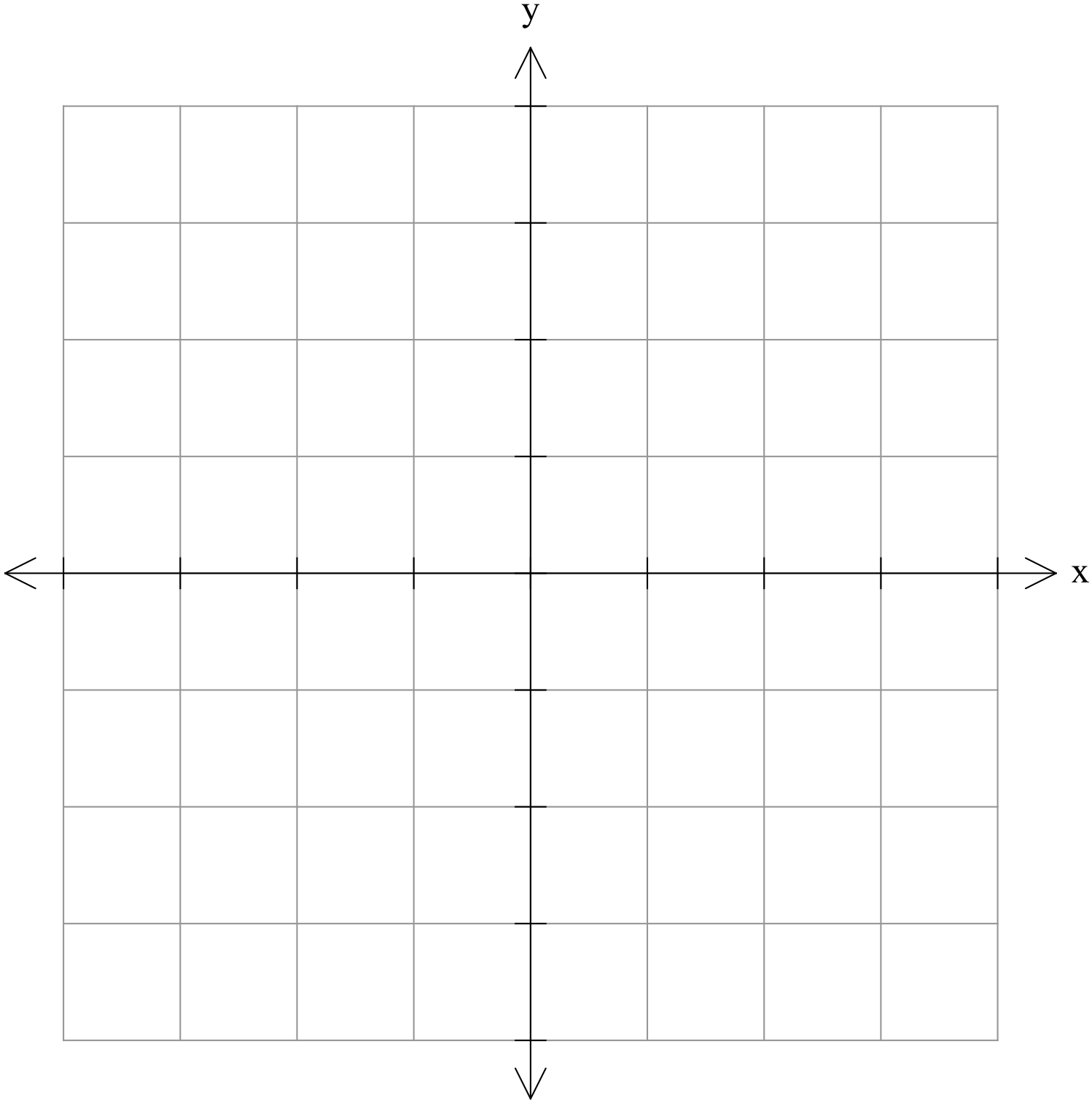
On the following axes, labelling everything clearly, graph the following functions:

and

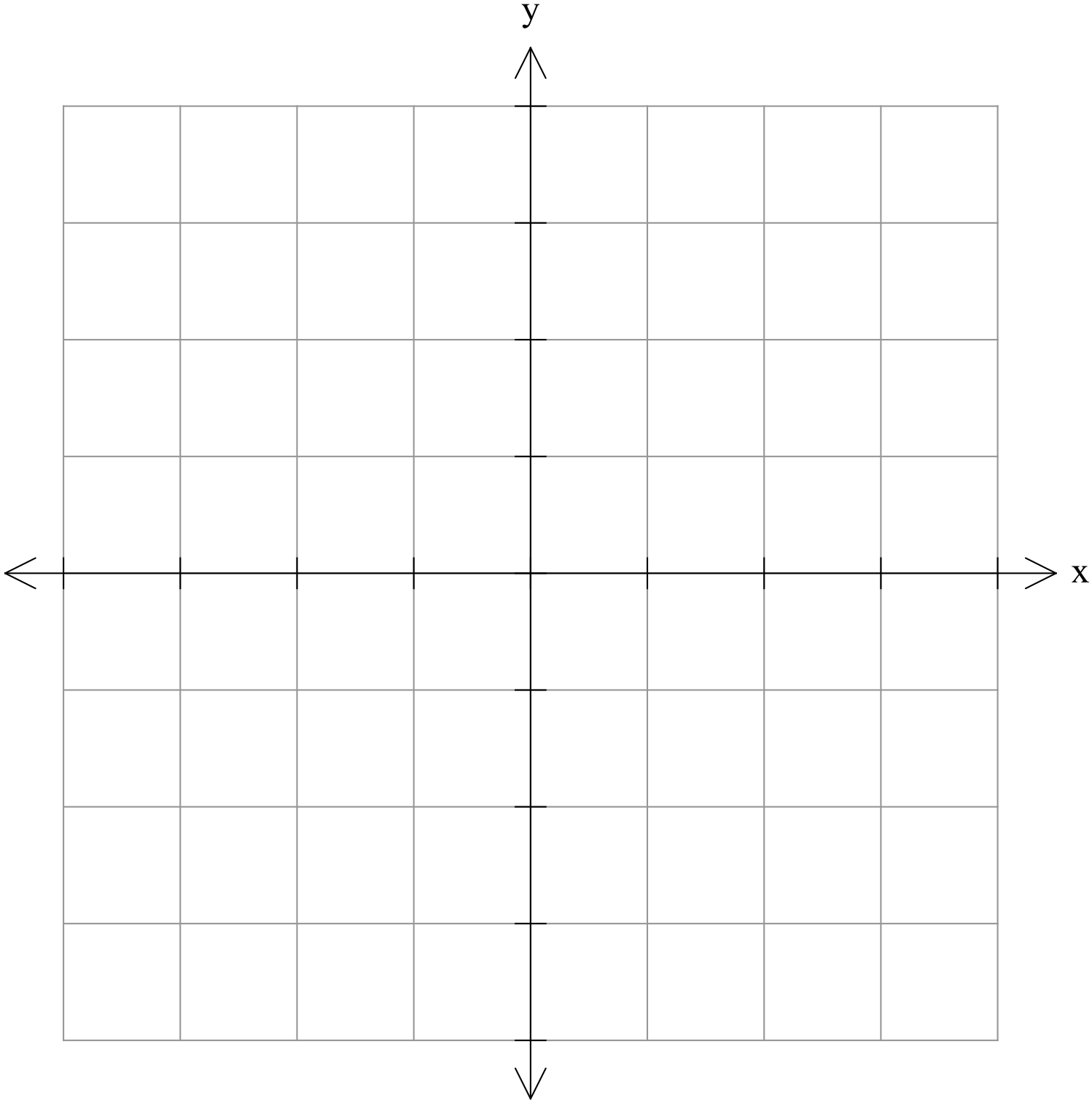
### [3 marks]

Comment on the effects that changes in *a* have on the graphs of .

### [5 marks]

On the following axes, labelling everything clearly, graph the following functions: 

and



### [5 marks]

On the following axes, labelling everything clearly, graph the following functions:

and

### [4 marks]

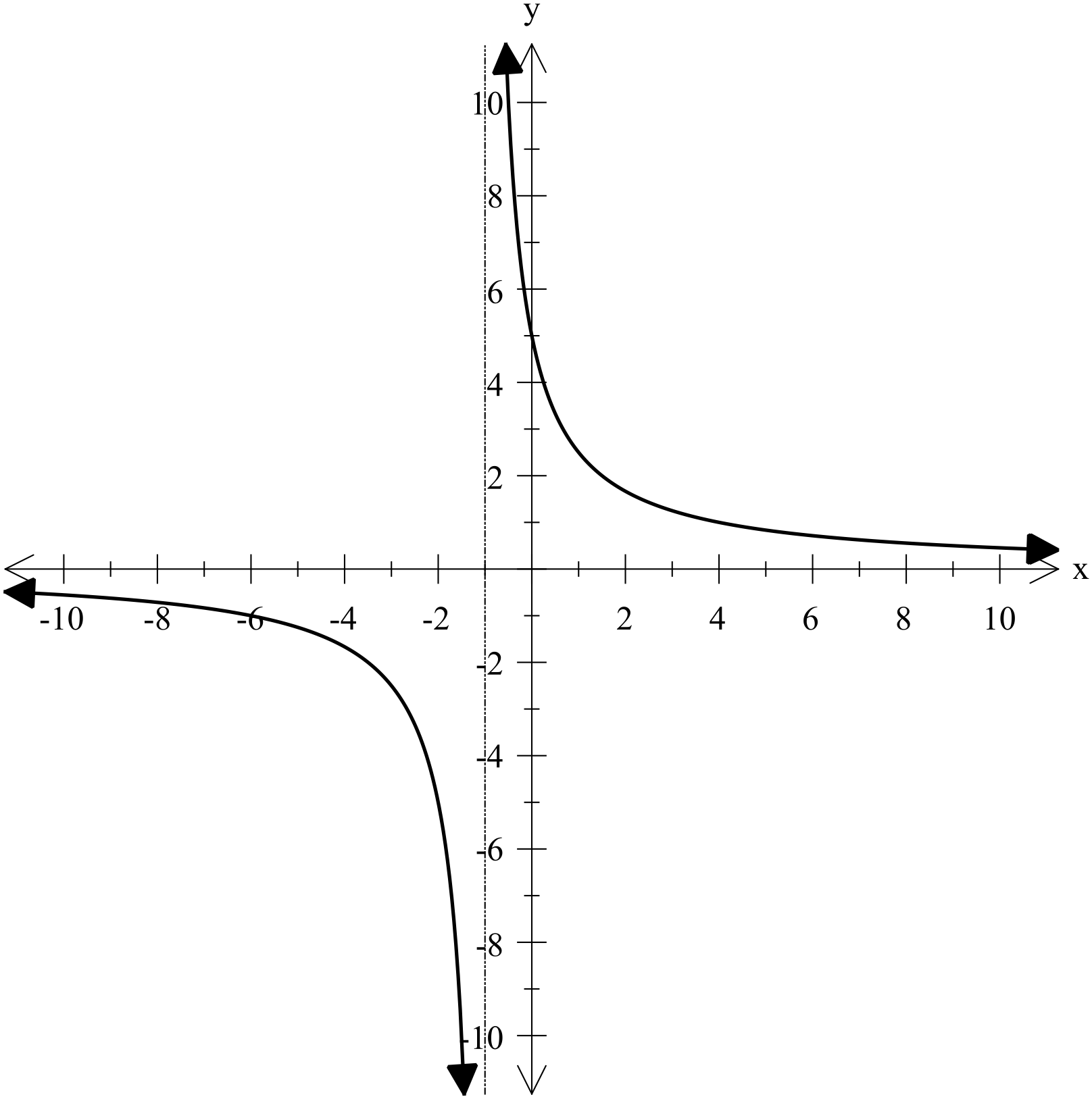
Comment on the effects that changes in *b* and *c* have on the graphs of .

### [3 marks]

On the following axes, labelling everything clearly, graph the following function:

### [4 marks]

(a) If the graph of has a *y-*intercept of 7, determine the value of *e*.



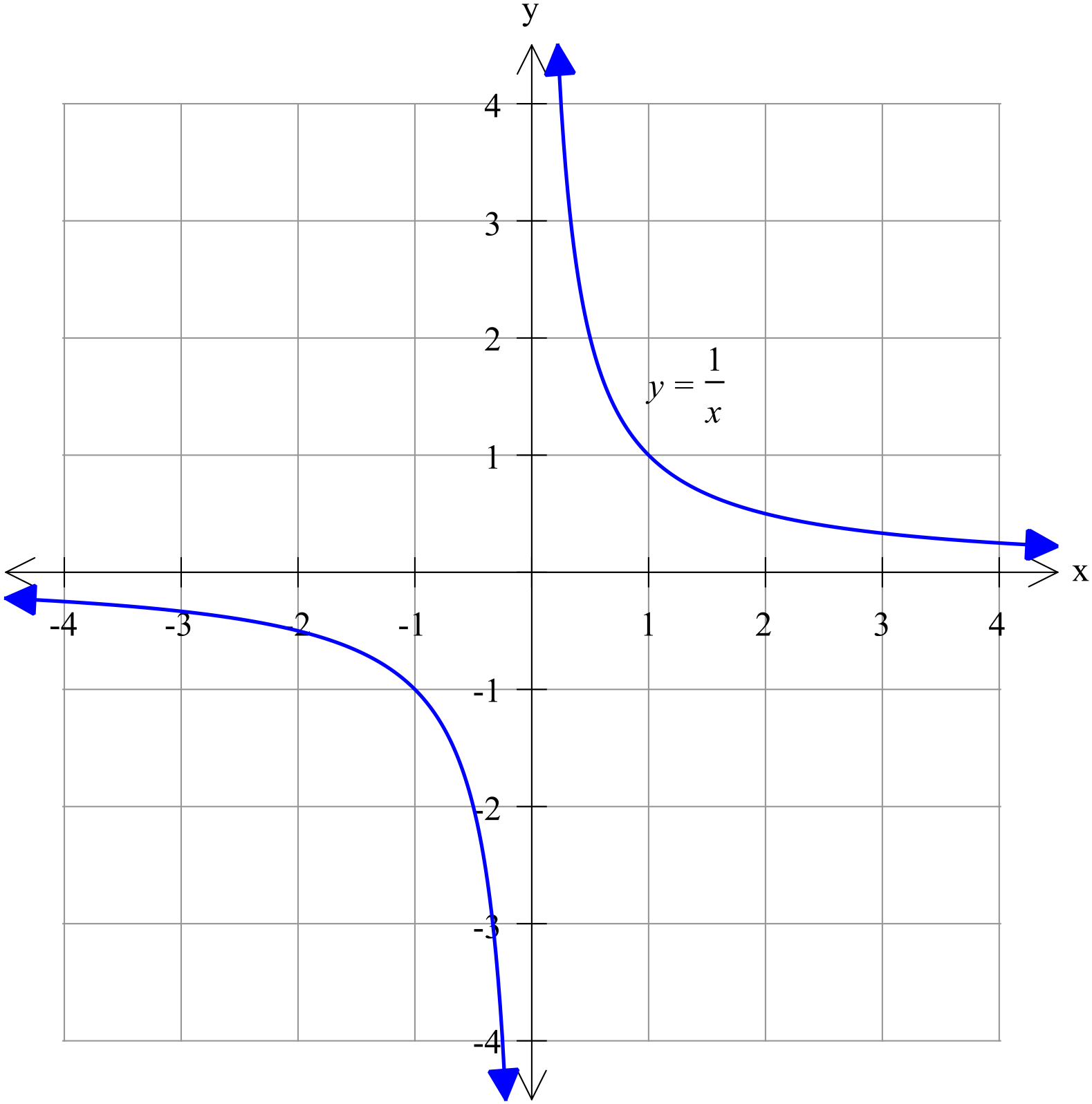
(b) The graph shown has an equation given as 

Determine the values of *r* and *s*.

**Investigating Graphs – Part A**

### [2 marks]

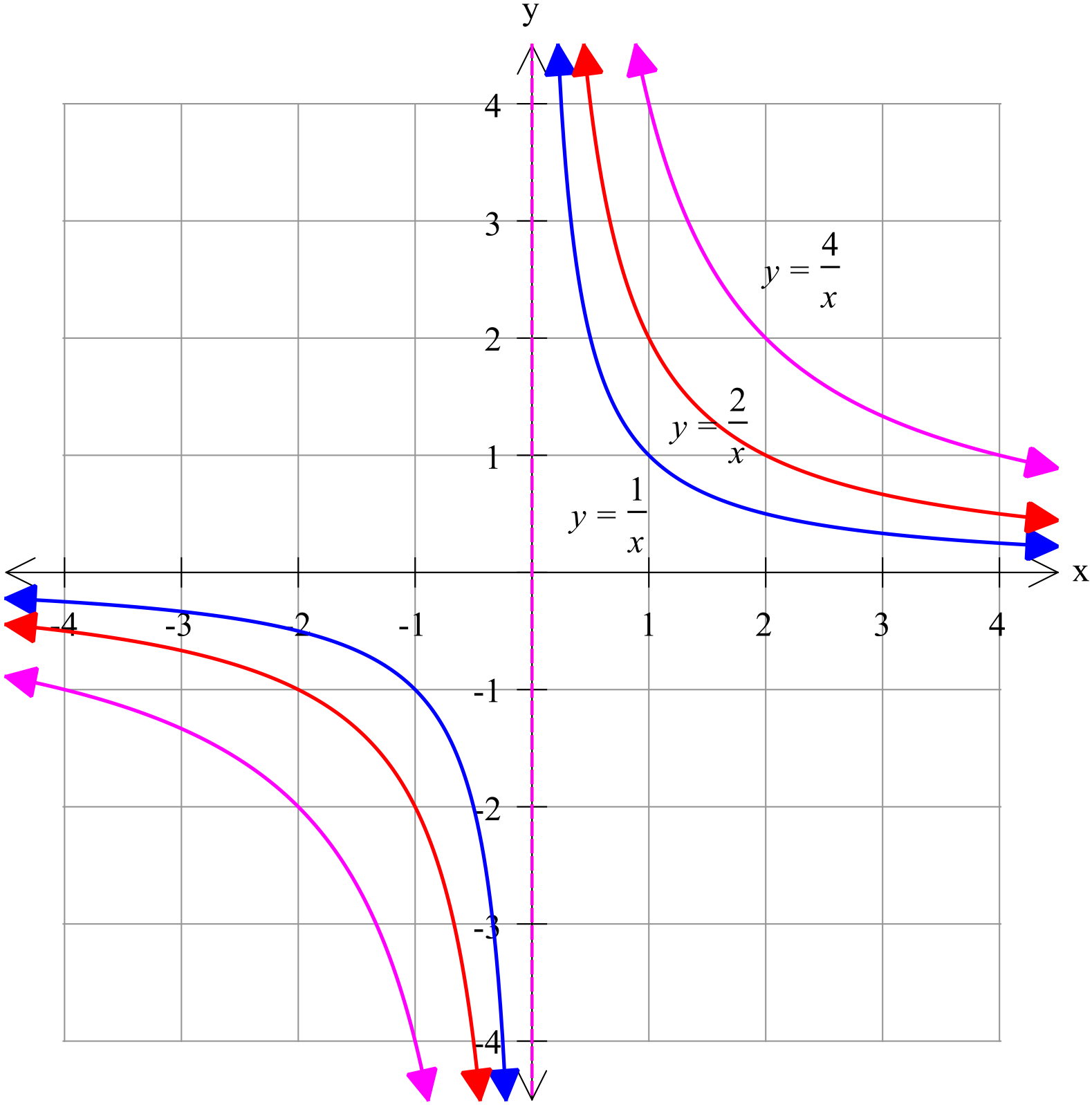
On the axes below, accurately graph the following function: .



### [5 marks]

On the following axes, labelling everything clearly, graph the following functions:

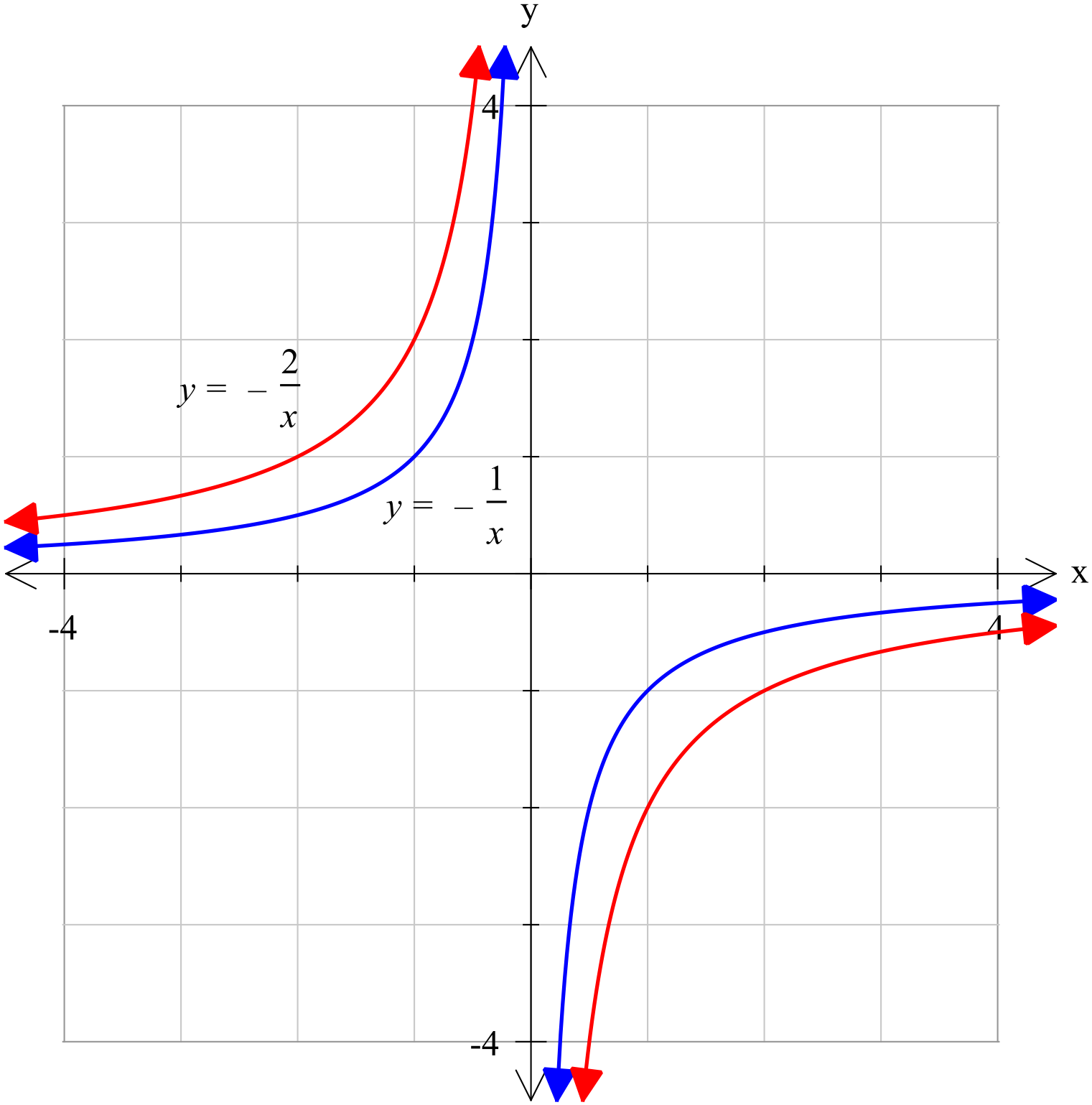
and



### [4 marks]

On the following axes, labelling everything clearly, graph the following functions:

and



### [3 marks]

Comment on the effects that changes in *a* have on the graphs of .

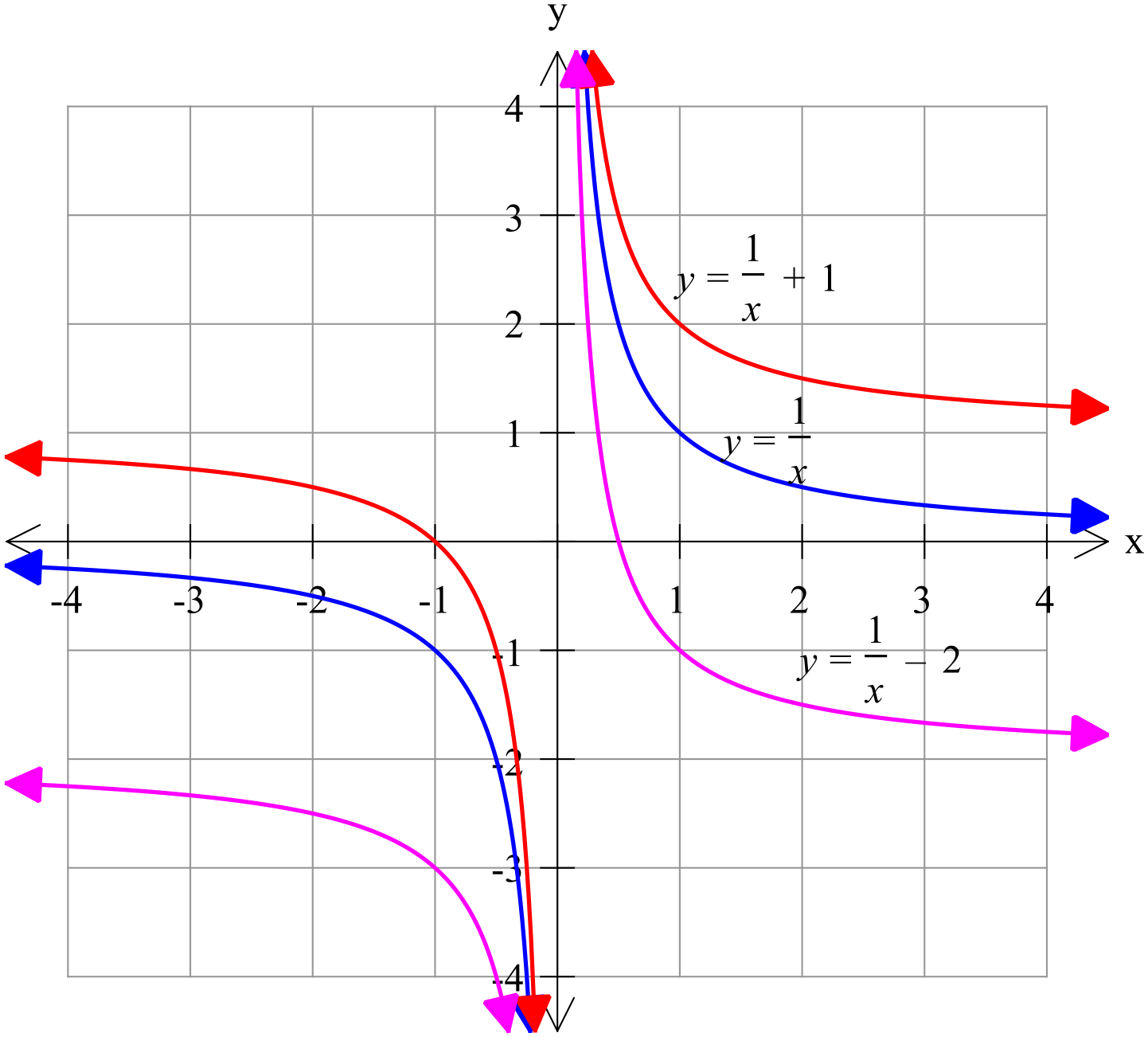
*a* is a dilation factor which stretches or compresses the graph of depending on the value of *a.* This affects the gradient of the curve and thus the distance the curve is from the axes. The larger the value of ⏐*a*⏐, the further it is from each axis.

Furthermore, if *a* is negative, the graph is inverted. That is the curves are in the second and fourth quadrants, rather than in the first and third.

### [5 marks]

On the following axes, labelling everything clearly, graph the following functions:

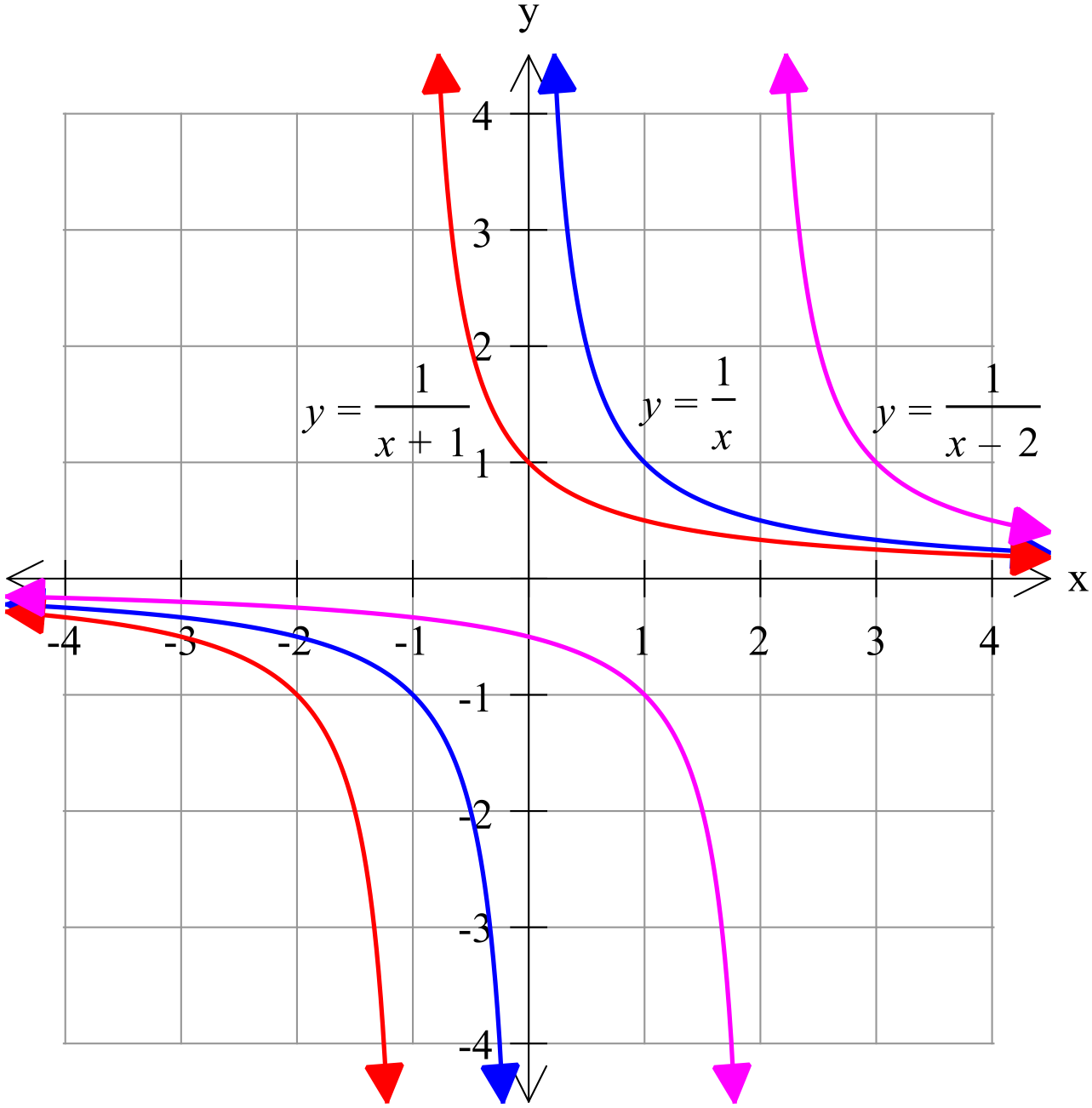
and



### [5 marks]

On the following axes, labelling everything clearly, graph the following functions:

and



### [4 marks]

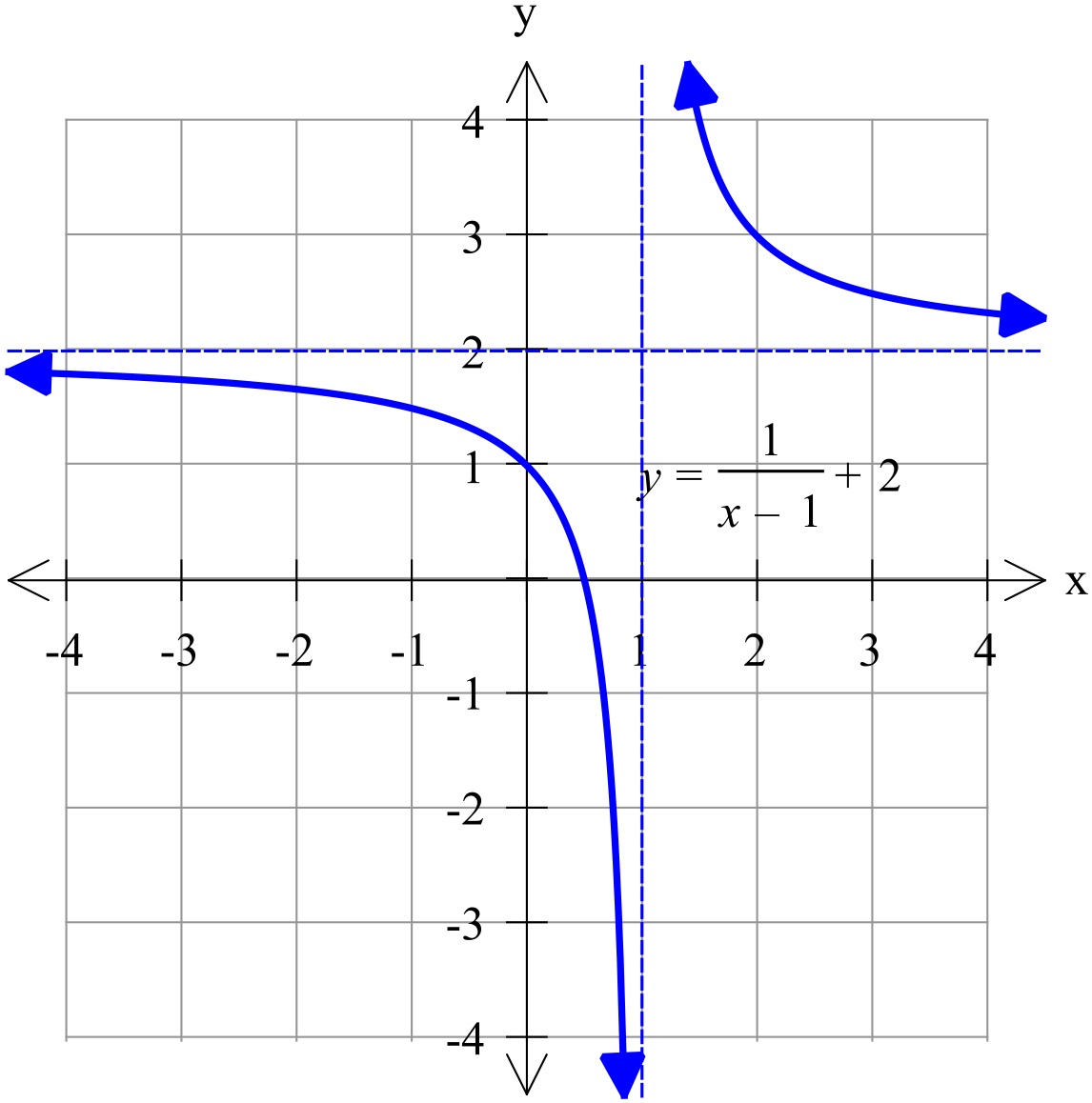
Comment on the effects that changes in *b* and *c* have on the graphs of .

is congruent to but has been moved *b* units right and *c* units up.

That is *b* is the distance of the horizontal translation and *c* the vertical translation.

### [3 marks]

On the following axes, labelling everything clearly, graph the following function:



### [4 marks]

(a) If the graph of has a *y-*intercept of 7, determine the value of *e*.

(a)

(b) The graph shown has an equation given as 

Determine the values of *r* and *s*.

and

Total: 35 marks