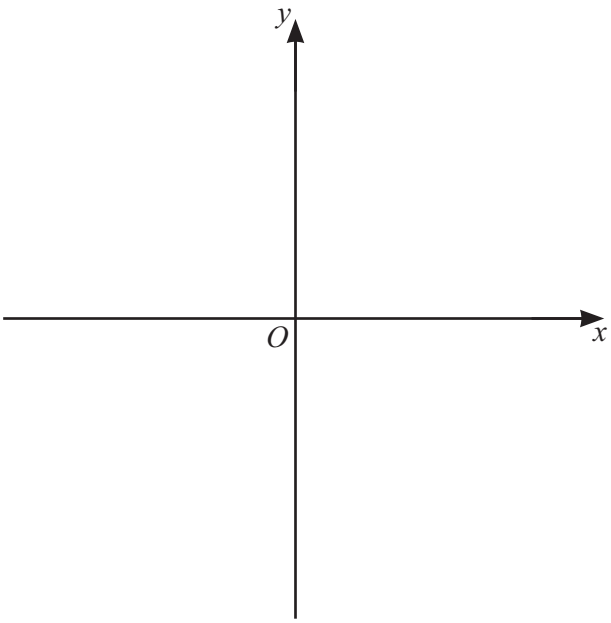
1 A curve has equation $y = x^2 + 2x - 3$.

(a) Use the method of completing the square to find the coordinates of the stationary point on the curve. [3]

(b) On the axes, sketch the curve, stating the intercepts with the coordinate axes. [2]



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2 In this question, k is a constant.
It is given that $2x^2 + (3k-2)x + k = 0$ has roots that are real and distinct.

Find the set of possible values of k. [5]

3 A sports club has the following members.

5 runners, 4 swimmers, 3 gymnasts

(a) These members stand in a straight line.

Find the number of ways that this can be done when all the runners stand together, all the swimmers stand together and all the gymnasts stand together. [2]

(b) Four of these members are selected for an event.

Find the number of ways that this can be done when at least one runner, at least one swimmer and at least one gymnast must be selected. [3]

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