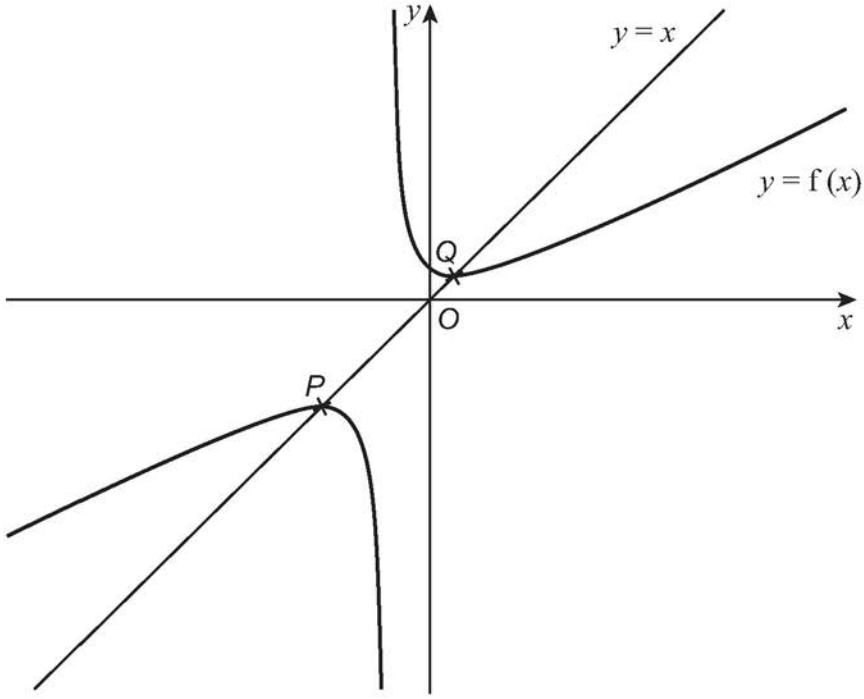
10 The function f is defined by

$$f(x) = \frac{x^2 + 10}{2x + 5}$$

where f has its maximum possible domain.

The curve $y = f(x)$ intersects the line $y = x$ at the points *P* and *Q* as shown below.



10 (a) State the value of x which is not in the domain of f.

[1 mark]

10 (b) Explain how you know that the function f is many-to-one.

[2 marks]

10 (c) (i) Show that the x-coordinates of *P* and *Q* satisfy the equation

$$x^2 + 5x - 10 = 0$$

[2 marks]

10 (c) (ii) Hence, find the exact x-coordinate of *P* and the exact x-coordinate of *Q*.

[1 mark]

10 (d) Show that *P* and *Q* are stationary points of the curve.

Fully justify your answer.

[5 marks]

10 (e) Using set notation, state the range of f.

[2 marks]