5 Fig. 5.1 shows part of the curve $y = x^{\frac{1}{2}}$. P is the point (1, 1) and Q is the point on the curve with $x$-coordinate $1+h$.

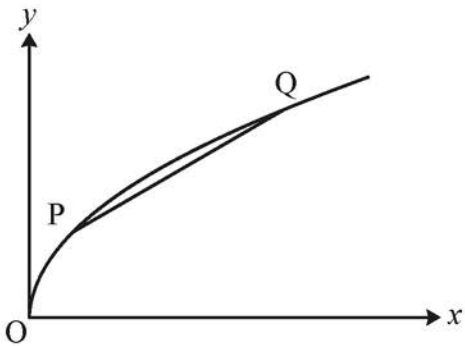


**Fig. 5.1**

Table 5.2 shows, for different values of $h$, the coordinates of P, the coordinates of Q, the change in $y$ from P to Q and the gradient of the chord PQ.

| $x$ for P | $y$ for P | $h$ | $x$ for Q | $y$ for Q | change in $y$ | gradient PQ |
|---|---|---|---|---|---|---|
| 1 | 1 | 1 | | | | |
| 1 | 1 | 0.1 | 1.1 | 1.048 809 | 0.048 809 | 0.488 088 |
| 1 | 1 | 0.01 | 1.01 | 1.004 988 | 0.004 988 | 0.498 756 |
| 1 | 1 | 0.001 | 1.001 | 1.000 500 | 0.000 500 | 0.499 875 |

**Table 5.2**

**(a)** Fill in the missing values for the case $h=1$ in the copy of Table 5.2 in the Printed Answer Booklet. Give your answers correct to 6 decimal places where necessary. **[1]**

**(b)** Explain how the sequence of values in the last column of Table 5.2 relates to the gradient of the curve $y = x^{\frac{1}{2}}$ at the point P. **[1]**

**(c)** Use calculus to find the gradient of the curve at the point P. **[2]**