

# TURUNAN DAN PENGGUNAAN

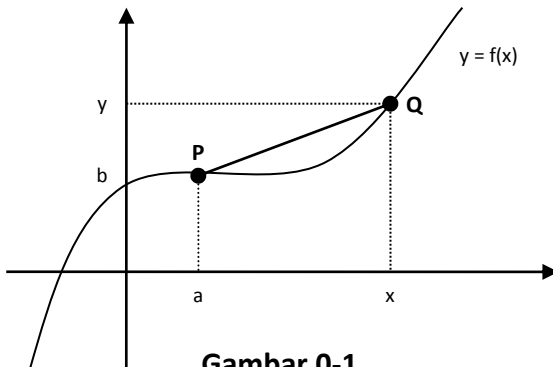
Oleh : Danang Mursita

Matematika untuk Perguruan Tinggi - [http://www.biobses.com/judul-buku,300-matematika\\_untuk\\_perguruan\\_tinggi.html](http://www.biobses.com/judul-buku,300-matematika_untuk_perguruan_tinggi.html)

Materi yang dibahas pada bab ini meliputi : Turunan Fungsi, Turunan Fungsi Trigonometri, Teorema Rantai, Turunan Tingkat Tinggi, Fungsi Implisit, Kemonotonan dan Kecekungan Fungsi, Nilai Ekstrim dan Asymtot, Penerapan Nilai Ekstrim, Dalil Delhopital

## 2.1 Turunan Fungsi

Misal diberikan grafik fungsi  $y = f(x)$  dengan  $P(a, b)$  merupakan titik tetap yang terletak pada kurva  $y = f(x)$ . Bila titik  $Q(x, y)$  merupakan titik sembarang pada kurva  $y = f(x)$  maka dapat dibuat garis yang menghubungkan titik  $P$  dan titik  $Q$  (misal dinamakan garis  $PQ$ ), seperti terlihat pada Gambar 2-1 berikut.



Gambar 0-1

Gradien garis  $PQ$  dapat dinyatakan dengan :

$$m_{PQ} = \frac{y - b}{x - a} = \frac{f(x) - f(a)}{x - a}$$

Bila titik  $Q$  digerakkan sehingga berimpit dengan titik  $P$  maka  $x$  akan

mendekati  $a$  ( $x - a \rightarrow 0$ ) dan  $f(x)$  mendekati  $f(a)$  ( $f(x) - f(a) \rightarrow 0$ ) serta garis  $PQ$  akan merupakan garis singgung kurva  $f(x)$  di titik  $P$ . Adapun gradien garis singgung  $PQ$  dinyatakan dengan :

$$m = \lim_{x \rightarrow a} \frac{f(x) - f(a)}{x - a}$$

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