

BASES OTHER THAN e I
AP CALCULUS

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Find the derivative.

1. $f(x) = 4^x$

$$f'(x) = (\ln 4) 4^x dx$$

2. $g(t) = t^2 2^t$

$$g'(t) = t \cdot 2^t (2 + t(\ln 2)) dt$$

3. $h(\theta) = 2^{-\theta} \cos \pi \theta$

$$h'(\theta) = -2^{-\theta} (\ln 2)(\cos \pi \theta) + \pi (\sin \pi \theta)$$

4. $f(x) = \log_2 \frac{x^2}{x-1}$

$$f'(x) = \frac{x-2}{x(x-1)(\ln 2)}$$

5. $y = \log_5 \sqrt{x^2 - 1}$

$$y' = \frac{x}{(x^2 - 1)(\ln 5)}$$

6. $g(t) = \frac{10 \log_4 t}{t}$

$$g'(t) = \frac{10}{t^2 \ln(4)} - \frac{10 \log_4 t}{t}$$

Find the equation of the tangent line at the given point.

7. $y = 2^{-x}; (-1, 2)$

$$y = -2(\ln 2)x - 2(\ln 2) + 2$$

8. $y = \log_3 x; (27, 3)$

$$y = \frac{1}{27(\ln 3)}x - \frac{1}{\ln(3)} + 3$$