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$$y = a^x \quad y = \log_a x \quad (a > 0, a \neq 1).$$

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$$y = x, y = x^2, y = x^3, y = \frac{1}{x}, y = x^{\frac{1}{2}}$$

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$y = \sin x, y = \cos x, y = \tan x$

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$x$

$[0, 2\pi]$

$\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$

$$\sin^2 x + \cos^2 x = 1, \frac{\sin x}{\cos x} = \tan x .$$

(5)  $y = A \sin(\omega x + \varphi)$   $y = A \sin(\omega x + \varphi)$  ,  $A$  ,

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4.  $\frac{a+b}{2} \sqrt{ab}$  ( $a > 0, b > 0$ )

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(1)  $y = C (C \quad )$ ,  $y = x$ ,  $y = x^2$ ,  $y = x^3$ ,  $y = \frac{1}{x}$ ,  $y = \sqrt{x}$ .

(2)

, (  $f(ax+b)$  ) .

$(C)' = 0$  (  $C \quad$  )  $(x^n)' = nx^{n-1}$ ,  $n \in \mathbf{N}_+$

$(\sin x)' = \cos x$   $(\cos x)' = -\sin x$

$(e^x)' = e^x$   $(a^x)' = a^x \ln a$  ( $a > 0$ ,  $a \neq 1$ )

$(\ln x)' = \frac{1}{x}$   $(\log_a x)' = \frac{1}{x} \log_a e$  ( $a > 0$ ,  $a \neq 1$ ).

1  $[u(x) \pm v(x)]' = u'(x) \pm v'(x)$ .

2  $[u(x)v(x)]' = u'(x)v(x) + u(x)v'(x)$ .

3  $\left[ \frac{u(x)}{v(x)} \right]' = \frac{u'(x)v(x) - u(x)v'(x)}{v^2(x)}$  ( $v(x) \neq 0$ ).

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6.  $(1+x)^n > 1+nx$  ( $x > -1, x \neq 0, n > 1$ ),  
 $n > 1$  .
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8. .