Calculus Notes

x IS A ___________________________.

$f(x)$ IS A _________________________.

LINES

Formula for a line

____

If you are given a slope " m " and a point (x_1, y_1)

____

If you are given two points (x_1, y_1) (x_2, y_2)

= ________

FUNCTIONS

$f(x)=x^2$ →

$f(2)$ = =
$f(3)$ = =
$f(4)$ = =

$f(x)=(x)(x^2+2)$ →

$f(0)$ = =
$f(1)$ = =
$f(2)$ = =

LIMITS

$\lim_{x \to a} f(x)$ →

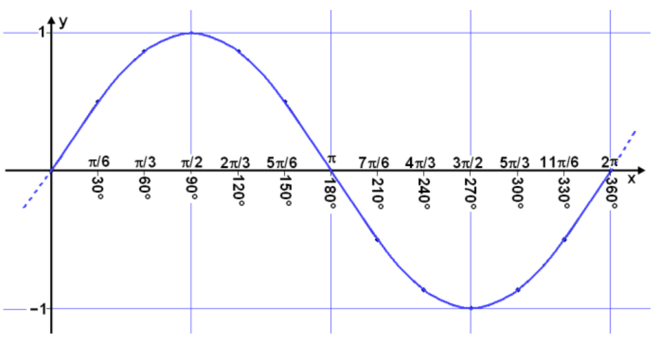
$\lim_{x \to a} x^2$ = _____

$\lim_{x \to \infty} 1/x^2$ = _____

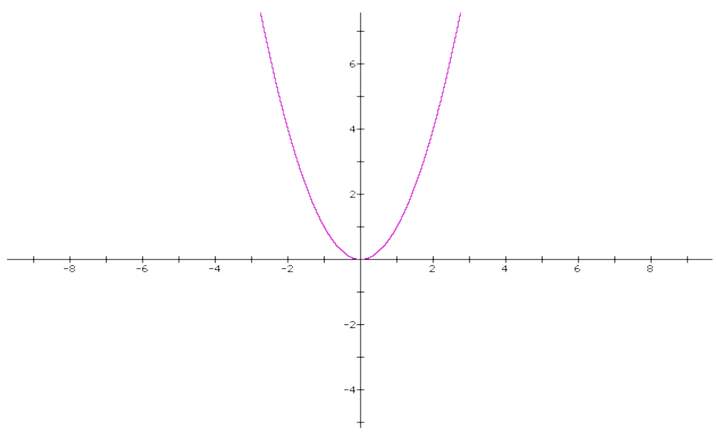
$\lim_{x \to 0} 1/x^2$ = _____

TANGENT LINES

Draw tangent lines at $x=\frac{\pi}{2}, x=\pi, x=\frac{3\pi}{2}$



Draw tangent lines at $x=0, x=2$



DERIVATIVES

THE FORMAL DEFINITION OF A DERIVATIVE:

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DERIVATIVE RULES

POWER RULE	SINE	COSINE	NUMBERS
$\frac{d}{dx}[x^n]=nx^{(n-1)}$	$\frac{d}{dx}[\sin x]=\cos x$	$\frac{d}{dx}[\cos x]=-\sin x$	$\frac{d}{dx}[n]=0$
EXPONENTIAL	LOGARITHMIC	NATURAL LOG	EXPONENTS
$\frac{d}{dx}[e^x]=$	$\frac{d}{dx}[\log_a x]=$	$\frac{d}{dx}[\ln x]=$	$\frac{d}{dx}[a^x]=$

PRODUCT RULE

$$\frac{d}{dx}[f(x)g(x)]=f'(x)g(x)+f(x)g'(x)$$

QUOTIENT RULE

$$\frac{d}{dx}[\frac{f(x)}{g(x)}]=\frac{f'(x)g(x)-f(x)g'(x)}{[g(x)]^2}$$

(P.S. $\frac{d}{dx}[f(x)]=f'(x)$)

CHAIN RULE

$$\frac{d}{dx}[f(g(x))]=g'(x)f'(g(x))$$

TAKE THE DERIVATIVE OF THE FOLLOWING:

$\frac{d}{dx}[x^2]=$	$\frac{d}{dx}[x^3]=$	$\frac{d}{dx}[e^x]=$	$\frac{d}{dx}[5^x]=$
$\frac{d}{dx}[\cos x]=$	$\frac{d}{dx}[x]=$	$\frac{d}{dx}[\log_2 x]=$	$\frac{d}{dx}[13]=$
$\frac{d}{dx}[\cos x^2]=$		$\frac{d}{dx}[e^{(x^2)}]=$	

ANTIDERIVATIVES

POWER RULE	COSINE	SINE
$\int x^n\,dx=$	$\int \cos x\,dx=$	$\int \sin x\,dx=$

EXPONENTIAL	LOGARITHMIC	NATURAL LOG	EXPONENTS
$\int e^x\,dx=$	$\int \log_a x\,dx=$	$\int \ln x\,dx=$	$\int a^x\,dx=$