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Name:

Collaborators:

Section Day/Time:

"The moving power of mathematical invention is not reasoning, but imagination."
-Augustus De Morgan

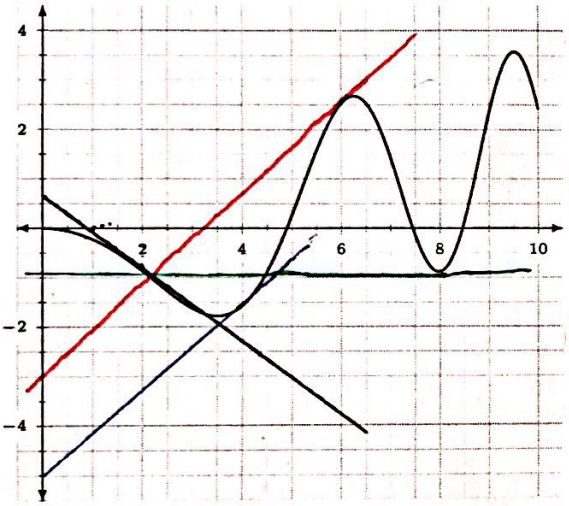
Tangents, Velocity, and Limits

Equation of a Tangent Line

A line tangent to curve $f(x)$ intersecting the y-axis at point b and having slope m can be expressed in *slope-intercept form*: $y = mx + b$.

1. Draw the lines tangent to the corresponding values of x, and complete the chart on the right with appropriate estimates.

Remember, these are approximations.



x	slope at $f(x)$	equation of line tangent to $f(x)$
2	-1	$y = -x + \frac{1}{2}$
4	1	$y = x - 5$
6	1	$y = x - 3$
8	0	$y = -1$

2. A kite's height in meters above the ground at time t is modeled by the function $f(t) = -(t-2)^3 + (t+2)^2 + 20$, where t is measured in seconds. Use the table provided to estimate the vertical velocity of the kite at the given points using points close to t.

t	$f(t+0.001)$	$f(t-0.001)$	Velocity
0	31.992	32.008	$\frac{31.992 - 32.008}{0.002} = -8$
2	36.008	35.992	8
4	48	48	0
6	19.968	20.032	-32