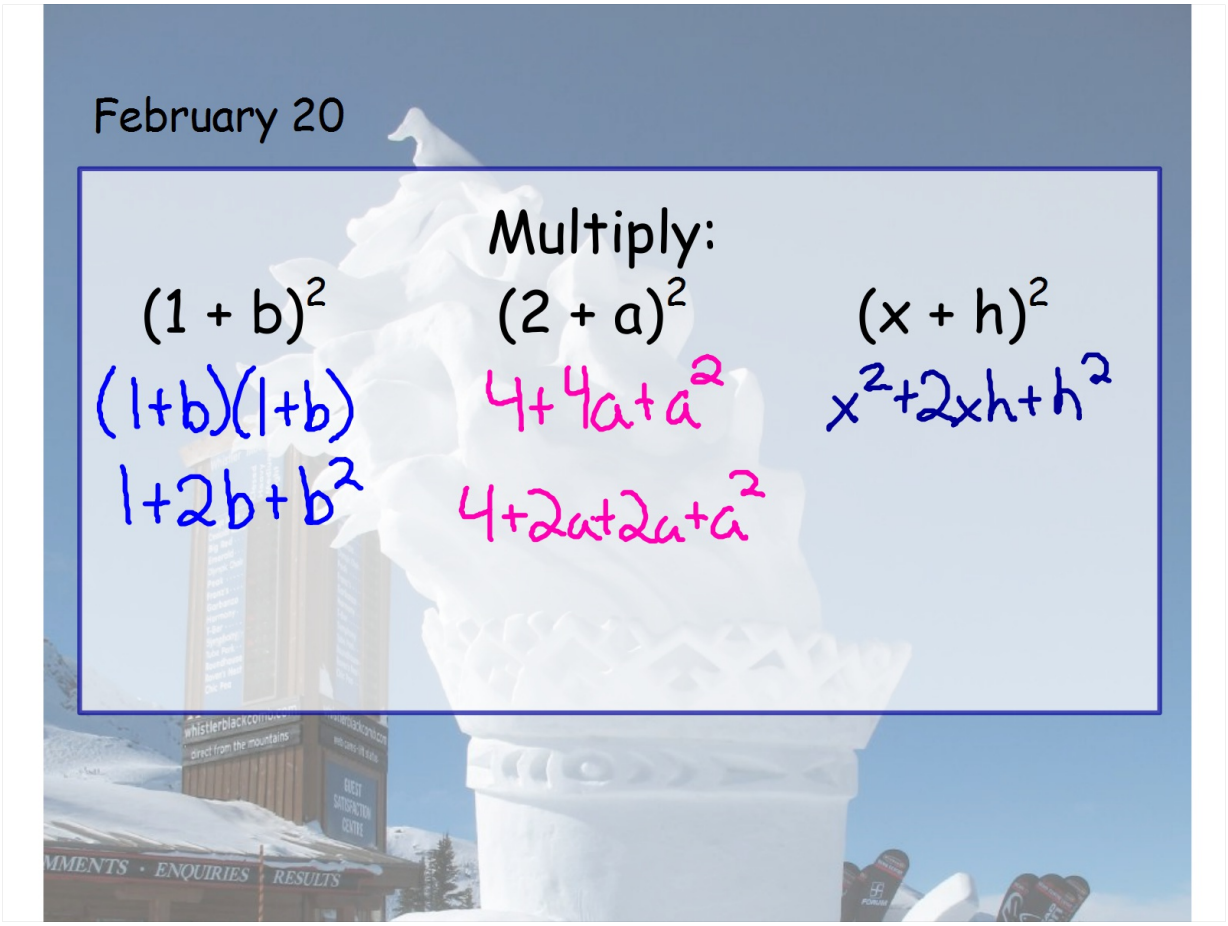
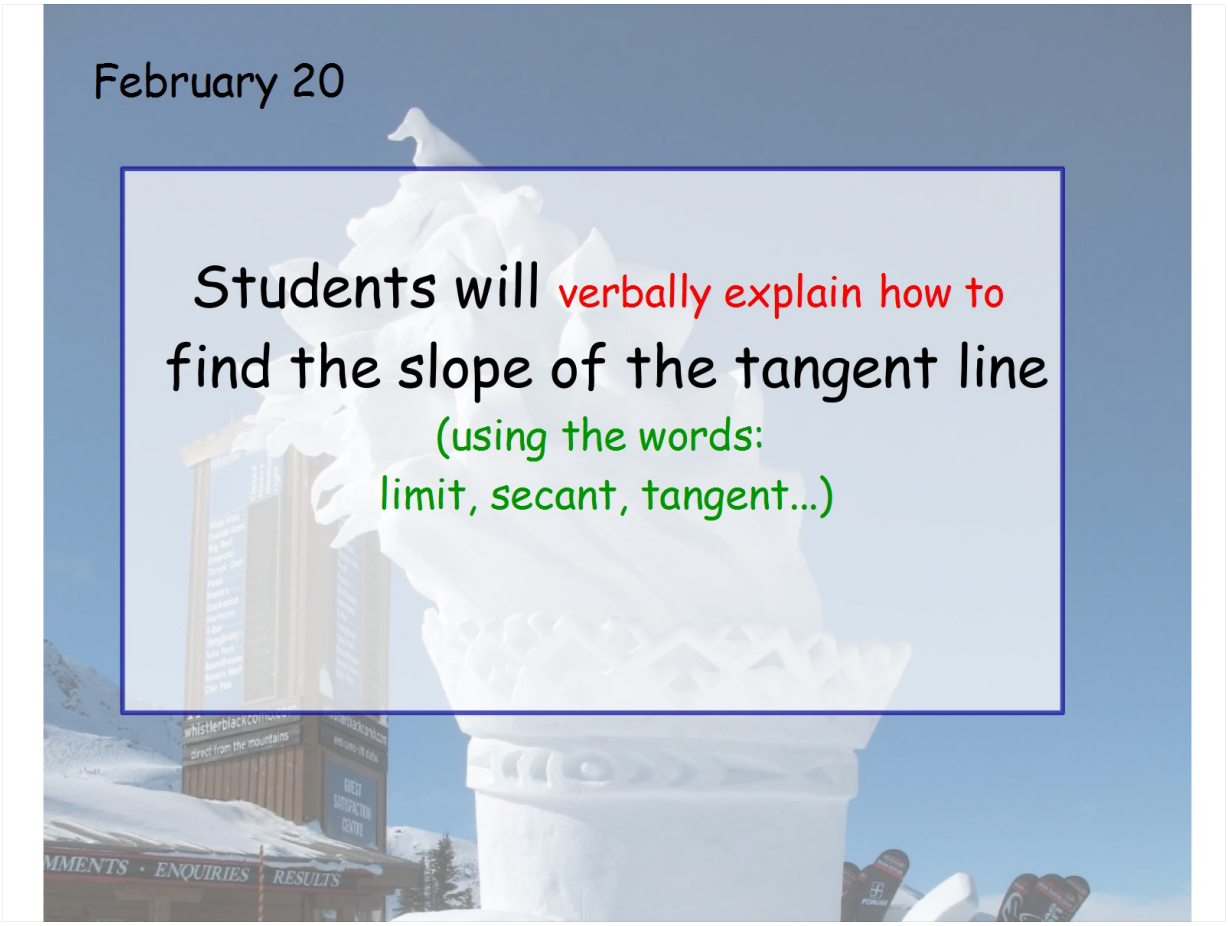

February 20
Multiply:
$(1 + b)^2$
$(1+b)(1+b)$
$1+2b+b^2$
$(2 + a)^2$
$4+4a+a^2$
$4+2a+2a+a^2$
$(x + h)^2$
$x^2+2xh+h^2$


February 20
Students will verbally explain how to find the slope of the tangent line
(using the words:
limit, secant, tangent...)

Slope of Secant Line

$$\frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}$$

$(a, f(a))$ $(b, f(b))$

$$\frac{f(b)-f(a)}{b-a}$$

Slope of Tangent Line

$$\lim_{b \to a} \frac{f(b)-f(a)}{b-a}$$

$$\lim_{h \to 0} \frac{f(x+h)-f(x)}{x+h-x} = \lim_{h \to 0} \frac{f(x+h)-f(x)}{h}$$

Equation 1

slope of tangent line

Find the slope of the line tangent to $f(x) = x^2$ at $x = 1$

$x = 2$

2 points

$(1, 1)$ $(1+h, (1+h)^2)$

$(1, 1)$ ↑ P

$$\text{Slope of secant line} = \frac{(1+h)^2 - 1}{(1+h) - 1} = \frac{(1+h)(1+h) - 1}{1+h-1}$$

$$= \frac{1+2h+h^2-1}{1+h-1} = \frac{2h+h^2}{h}$$

$$= \frac{h(2+h)}{h} = 2+h$$

$$\text{Slope of tangent line} = \lim_{h \to 0} \frac{(1+h)^2 - 1}{(1+h)-1} = \lim_{h \to 0} 2+h = 2$$

Write an equation of the line tangent to $f(x) = x^2$ at $x = 1$

$x = 2$

slope = 2

point = (1, 1)

$y - y_1 = m(x - x_1)$

$y - 1 = 2(x - 1)$