Part 1 – Introduction & Limits

Press ctrl and the forward and backward arrows on the TouchPad to navigate between pages. Press ctrl + tab to toggle between applications on a split screen.

1. Before taking calculus, what had you heard about the subject?

Read page 1.3.

2. What are the three major concepts of calculus?

The three major concepts of calculus are the _____, the _____, and the _____. The first topic is part of the definition for the other two.

3. Press Play on the animation on page 1.4. As *x* approaches *c*, what is the value the function is approaching? In other words, as *x* gets closer to *c*, but not equal to *c*, the value of *f*(*x*) gets closer to what one value?

Part 2 – Derivatives & Optimization

4. In calculus, what is an extrema?

On page 1.6, press ctrl + tab a few times to toggle down until the graph is outlined or simply click 'pause animation.' The point of tangency can be grabbed by pressing ctrl +  or by pressing and holding  . Drag this point back and forth or press Play.

5. For the 4th degree polynomial shown, how many extrema does this function have?

6. What is the slope of the tangent at these local maximum and minimum points?

Read page 1.7 and observe the animation.

7. How is the derivative defined?

Read page 2.1 and 2.2. On page 2.3 move point *h* on the slider by grabbing and dragging it.

8. a. What is the approximate maximum volume and when does this occur?

b. Using calculus, how could the exact maximum value of the volume function be found?

Part 3 – Integrals and History

Adding rectangles will come up in the study of calculus.

9. What is the area of the rectangle shown on page 3.1?

On page 4.2, watch the animation. Press [A] to auto rotate the 3D graph.

10. The volume can be found by adding cylinders of width *dx*. What is this function rotated about?

Read page 5.1 and 5.2

11. Who were the co-discovers of calculus (even though they did not work together)?

12. What did you learn from this activity? Especially explain your current understanding of the three main concepts of calculus.