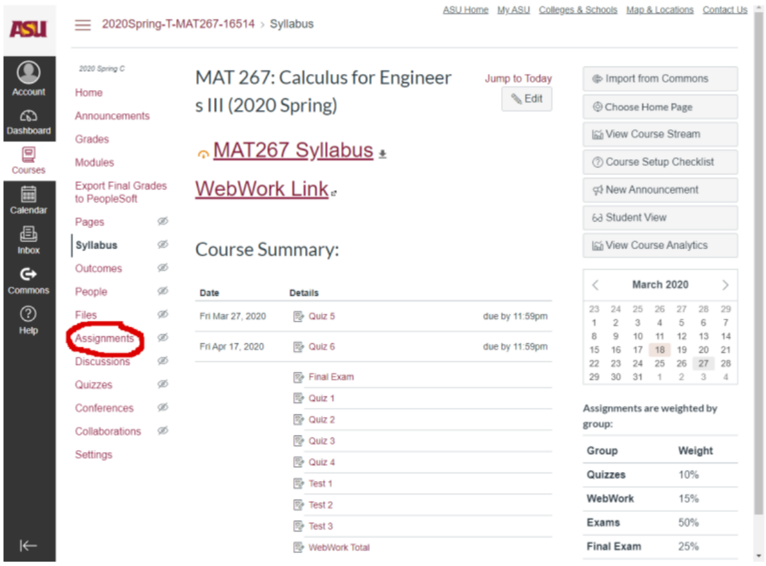
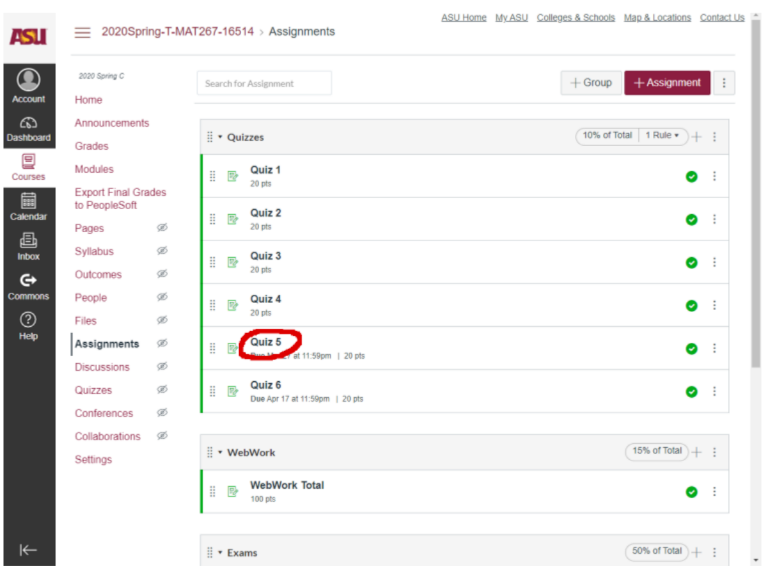
<u>Instructions for grading in Canvas</u>

There is a video that also discusses how to grade in Canvas. It can be found online at
https://player.mediaamp.io/p/U8-EDC/qQivF4esrENw/embed/select/media/Q87hfPj7z6z9?form=html

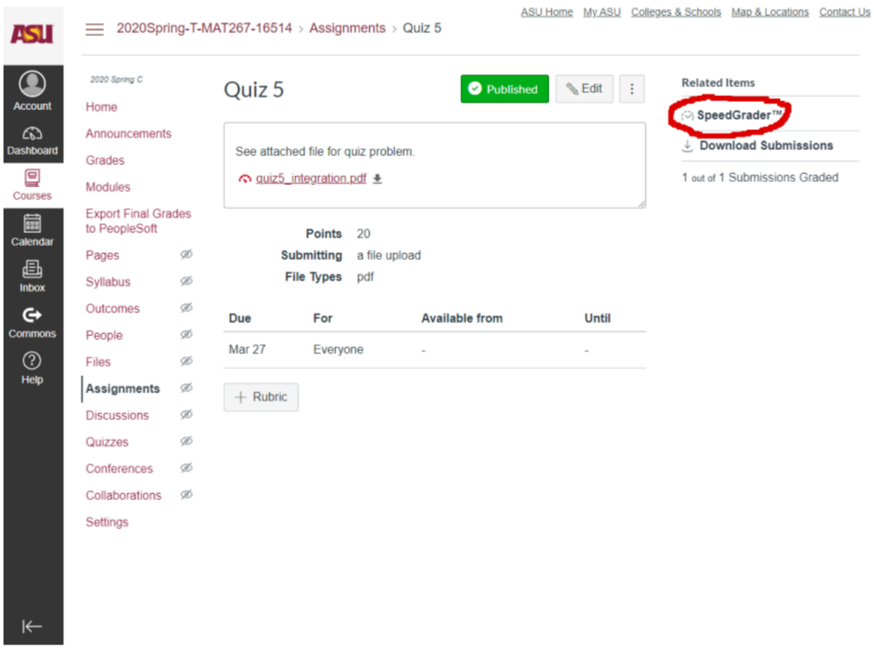
1. Open the Canvas site and click “Assignments” in the sidebar menu.



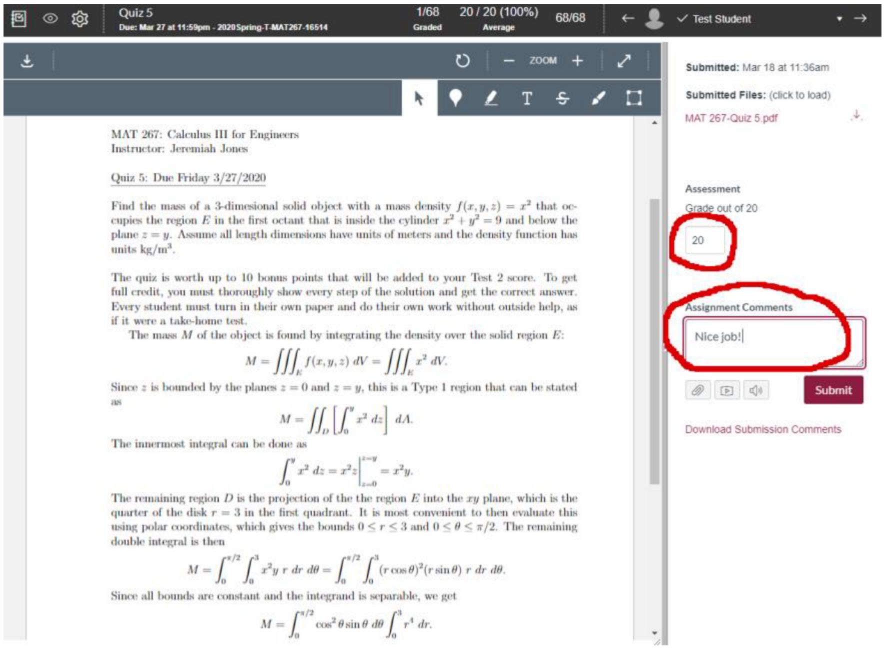
2. Click on the assignment you wish to grade (Quiz 5 in this example).



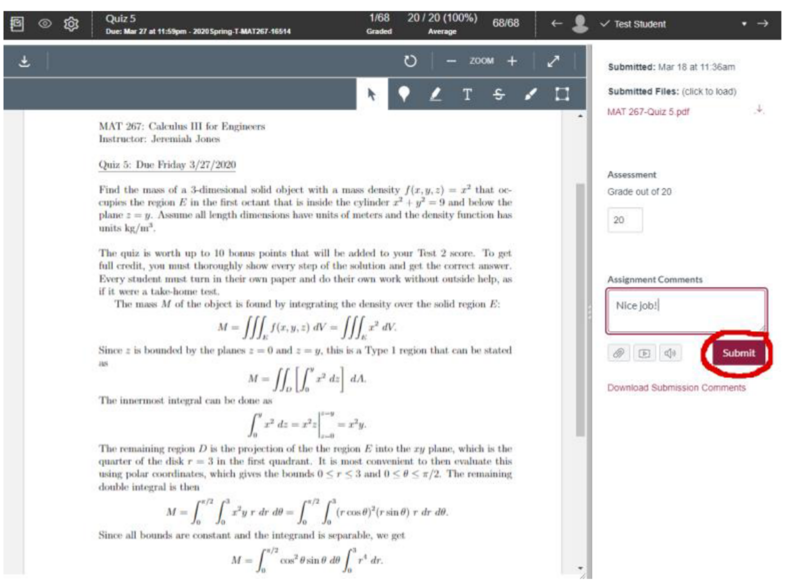
3. Click on the SpeedGrader link in the upper right corner. This will open a new window where you will do the grading.



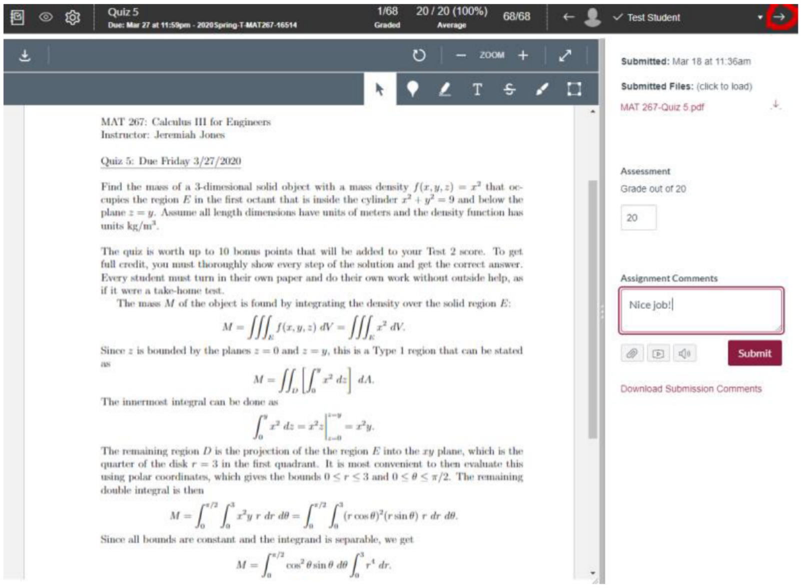
4. The student's pdf file will be displayed on the left. After reviewing their work, enter their score in the "Assessment" box and enter any feedback comments in the "Assignment Comments" box.



5. Click the Submit button to save the score into the gradebook.



6. Click the right-arrow in the upper corner of the screen to move on to the next student and repeat.



MAT 267: Calculus III for Engineers
Instructor: Jeremiah Jones

Quiz 5: Due Friday 3/27/2020

Find the mass of a 3-dimesional solid object with a mass density $f(x, y, z) = x^2$ that occupies the region E in the first octant that is inside the cylinder $x^2 + y^2 = 9$ and below the plane $z = y$. Assume all length dimensions have units of meters and the density function has units kg/m^3.

The quiz is worth up to 10 bonus points that will be added to your Test 2 score. To get full credit, you must thoroughly show every step of the solution and get the correct answer. Every student must turn in their own paper and do their own work without outside help, as if it were a take-home test.

The mass M of the object is found by integrating the density over the solid region E:

$$M = \iiint_E f(x, y, z)\, dV = \iiint_E x^2\, dV.$$

Since z is bounded by the planes $z = 0$ and $z = y$, this is a Type 1 region that can be stated as

$$M = \iint_D \left[\int_0^y x^2\, dz\right] dA.$$

The innermost integral can be done as

$$\int_0^y x^2\, dz = x^2 z\Big|_{z=0}^{z=y} = x^2 y.$$

The remaining region D is the projection of the the region E into the xy plane, which is the quarter of the disk $r = 3$ in the first quadrant. It is most convenient to then evaluate this using polar coordinates, which gives the bounds $0 \le r \le 3$ and $0 \le \theta \le \pi/2$. The remaining double integral is then

$$M = \int_0^{\pi/2}\int_0^3 x^2 y\; r\; dr\; d\theta = \int_0^{\pi/2}\int_0^3 (r\cos\theta)^2 (r\sin\theta)\; r\; dr\; d\theta.$$

Since all bounds are constant and the integrand is separable, we get

$$M = \int_0^{\pi/2} \cos^2\theta \sin\theta\; d\theta \int_0^3 r^4\; dr.$$