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| 1.
 | A cylindrical container has h = 5 m and r= 3 m. Given that the density of water is $density =\left(1000\right)\frac{kg}{m^{3}}$ .We wish to know how much work is needed to fill the container with water?Note: Work (Joules) = Force \* DistanceForce (Newtons) = Mass\* Acceleration = 9.8 \* mass |

1. In the diagram above, divide the container into *n* divisions so that the distance the water must be raised tol is approximately constant in each division.
2. Draw a representative division: This is representative of the *ith* division, where *i* goes from 1 to n. Express the approximate work for this division in terms of $x\_{i}$ and$ ∆x$
3. Express an approximation of the total work in the form $\sum\_{i=1}^{n}…∆x$
4. Take the limit of part c to find an integral expression representing the precise work. You do not need to solve this integral.
5. We wish to make a giant jello cone for which we use a mold with height 2 m and base raidus 4 m. Given that the gelatin solution hass $density =\left(1300\right)\frac{kg}{m^{3}}$ .We wish to know how much work is needed.

Notes: Work (Joules) = Force \* Distance and Force (Newtons) = Mass\* Acceleration = 9.8 \* mass

1. Sketch the cone and divide it into *n* divisions so that the distance the jello must be raised tol is approximately constant in each division.
2. Draw a representative division: This is representative of the *ith* division, where *i* goes from 1 to n. Express the approximate work for this division in terms of $x\_{i}$ and$ ∆x$
3. Express an approximation of the total work in the form $\sum\_{i=1}^{n}…∆x$
4. Take the limit of part c to find an integral expression representing the precise work. You do not need to solve this integral.

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| 1. See the source image
 | A truncated stone pyramid made of stone has h =10 m, a = 40 m and b = 20 m with the shape to the left. The density of the stone that was used is $density =3000\frac{kg}{m^{3}}$ We are looking for the amount of work needed to construct it. |

1. Divide it the volume into *n* divisions so that the distance is approximately constant for each division.
2. Draw a representative division: This is representative of the *ith* division, where *i* goes from 1 to n. Express the approximate work for this division in terms of $x\_{i}$ and$ ∆x$
3. Express an approximation of the total work in the form $\sum\_{i=1}^{n}…∆x$
4. Take the limit of part c to find an integral expression representing the precise work. You do not need to solve this integral.
5. We wish to use Riemann sums with cuboids to approximate the amount of work that is needed to construct a concrete pyramid with a square base of length = 10 m and a height of 20 m. The concrete is denser at the base than at the top due to settling and is given by $density =\left(2400-10x\right)\frac{kg}{m^{3}}$ where *x* is the distance from the base of the pyramid.
6. Sketch the pyramid and, divide it into *n* divisions so that the density and distance are approximately constant for each division.
7. Draw a representative division: This is representative of the *ith* division, where *i* goes from 1 to n. Express the approximate work for this division in terms of $x\_{i}$ and$ ∆x$
8. Express an approximation of the total work in the form $\sum\_{i=1}^{n}…∆x$
9. Take the limit of part c to find an integral expression representing the precise work. You do not need to solve this integral.