What month is your birthday ?       ___ ___
What are the first 2 digits of your address ?       ___ ___
What are the last 2 digits of your zip code ?       ___ ___
What are the last 2 digits of your DeAnza ID number ?       ___ ___

**SCORE: ___ / 30 POINTS**

## NO CALCULATORS ALLOWED

## SHOW PROPER ALGEBRAIC WORK
## USE PROPER NOTATION & SIMPLIFY ALL ANSWERS WHERE REASONABLE

**MULTIPLE CHOICE: CIRCLE THE CORRECT ANSWER**          **SCORE: ___ / 3 POINTS**

A $5$ foot long chain weighing $8$ pounds hangs from a hook in the ceiling of an $11$ foot tall room. (So, the bottom of the chain is $6$ feet from the floor.) How many foot-pounds of work are done lifting the bottom loop of the chain to the ceiling so that it touches the top loop ?
**(HINT: Draw "before" and "after" diagrams.)**

[a]   25          [b]   (10)          [c]   20          [d]   30          [e]   15

A $50$ foot chain weighing $4$ pounds per foot hangs over the edge of a $50$ foot tall building. The chain is used   **SCORE: ___ / 6 POINTS**
to lift a $25$ pound tabletop from ground level to a window $20$ feet above ground.
Write, **BUT DO NOT EVALUATE**, an expression involving an integral (or sum of integrals) for the work done.
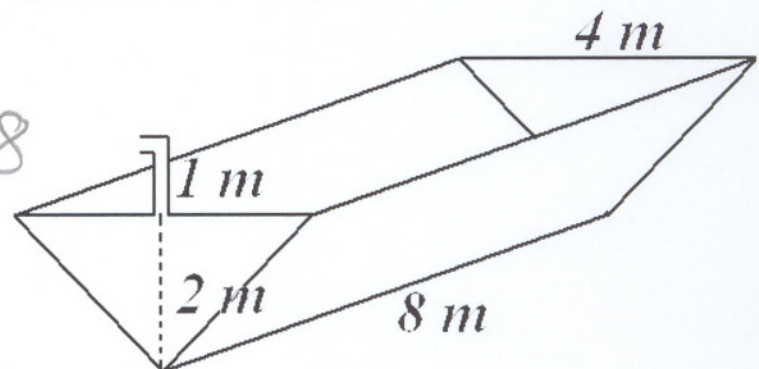
*SEE 7:30 VERSION 8*

A tank in the shape of the triangular prism shown on the right is filled with water.          **SCORE: ___ / 6 POINTS**
Write, **BUT DO NOT EVALUATE**, an integral for the work required to pump the water out of the spout.

*SEE 7:30 VERSION 8*

The region bounded by $x = 1$, $y = \ln x$ and $y = 1$ is revolved around the $y$-axis. Find the volume of the solid.

SEE 7:30 VERSION 8

The region bounded by $y = -2$, $y = \dfrac{1}{2}x - 1$ and $y = x - 2$ is revolved around the line $y = 1$.

[a] Write, **BUT DO NOT EVALUATE**, an integral (or sum of integrals) for the volume of the solid using the shell method.

SEE 7:30 VERSION 8

[b] Write, **BUT DO NOT EVALUATE**, an integral (or sum of integrals) for the volume of the solid using the washer method.

SEE 7:30 VERSION 8

[c] Find the volume of the solid by evaluating the appropriate integral(s) from either [a] or [b].

SEE 7:30 VERSION 8