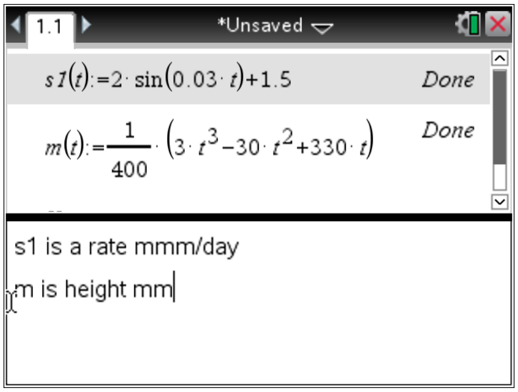
AP Calculus

Technology Tuesday #2 Calculator Solutions

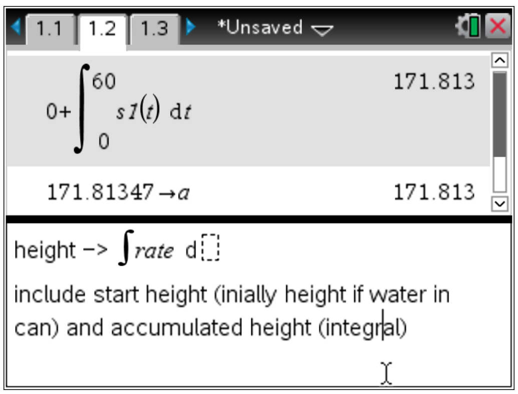
Name: ______________________________

Date: _____________________ Per: ____

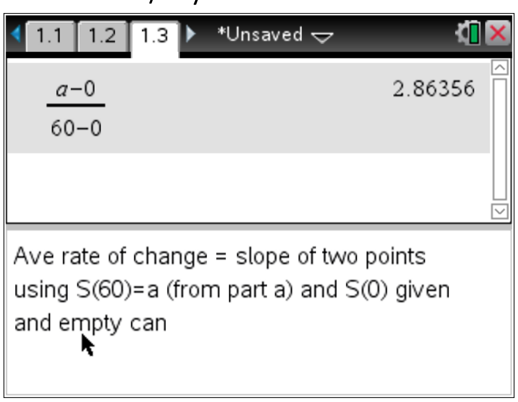
1)



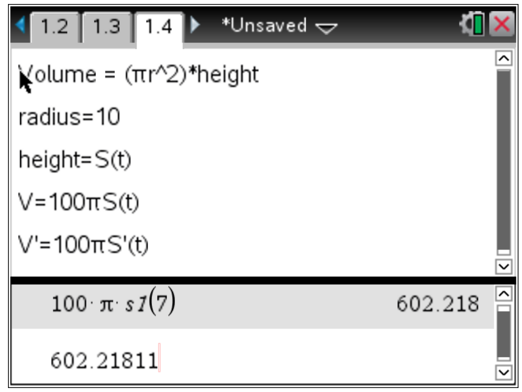
a. We are finding S(60)=s(0)+integral below, we store the answers as "a" for use in part b. UNITS "mm"



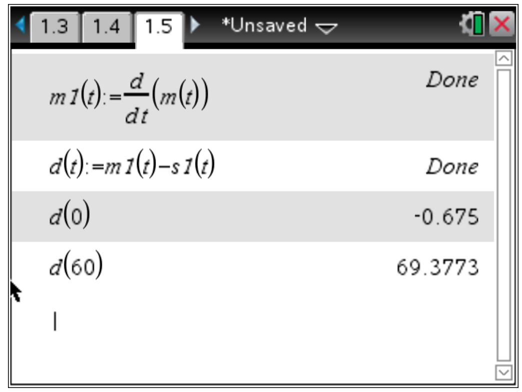
b. UNITS "mm/day"



c. UNITS "mm^3/day"



d.



d is the difference in the RATES, D is continuous, thus the IVT theorem will apply. D(0)<0 means that M'(t)<S'(t) and D(60)>0 means M'(t)>S'(t). So at some point D(c)=0, at which time M' and S' had to be the same.

2)

1.4 | 1.5 | 2.1 | *Unsaved

$r(t):=25\cdot e^{-0.05\cdot t}$ Done

use the number e not the letter

a. $\int_0^{12} P(t)dt =$ store for use in part c

2.2 | 2.3 | 2.4 | *Unsaved

$(4-0)\cdot 46+(8-4)\cdot 57+(12-8)\cdot 62$ 660

$660 \to a$ 660

three subintervals (widths) from 0–4, 4–8, 8–12 with midpoints 2, 6, 10 (use these numbers for heights)

these are VOLUMES so the units are ft^3

b. Store for use in part c

2.2 | 2.3 | 2.4 | *Unsaved

$\int_0^{12} r(t)\, dt$ 225.594

$225.59418 \to b$ 225.594

volume of water -> $\int rate\ of\ volume\ d$

c.

2.2 | 2.3 | 2.4 | *Unsaved

$1000+a-b$ 1434.41

Water in tank after 12 hours =water at start+water pumped in over 12 hours−water leaked out over 12 hours

NEAREST CUBIC FOOT = 1434

d.

2.3 | 2.4 | 2.5 | *Unsaved

V'(t) will represent the rate of volume change

V'(t)=P(t)−R(t) (since P and R are already rates)

V'(8)=P(8) − R(8) store for next part

$60-r(8)$ 43.242

$43.24199 \to c$ 43.242

2.4 | 2.5 | 2.6 | *Unsaved

Want how fast the HEIGHT is changing, h'

V=πr^2h=144h

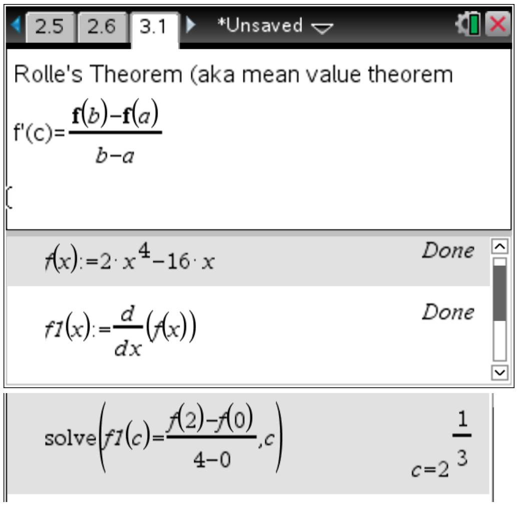
V'=144h'

V'(8)=144*h'(8)

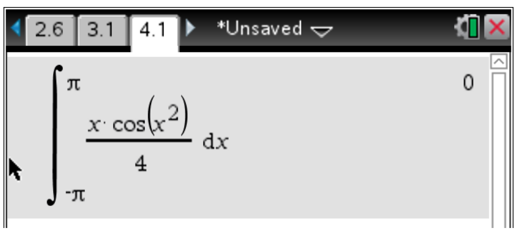
for calc purposes we will use h for h'(8)

$\text{solve}(c=144\cdot\pi\cdot h,h)$ $h=0.095586$

3) Change the interval to [0,2]



4)



5) Graph then use MENU->ANALYZE->ZERO click to the left of the zero for a lower bound and click right of the zero for the upper bound, two zeros means you have to do this twice.