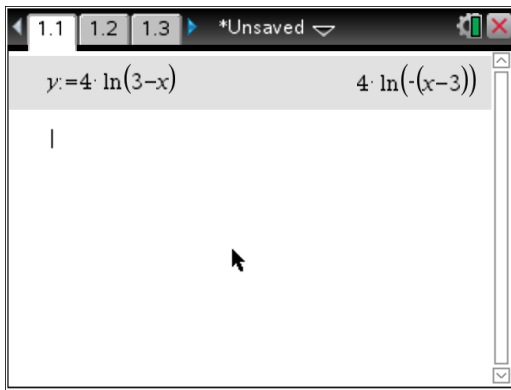
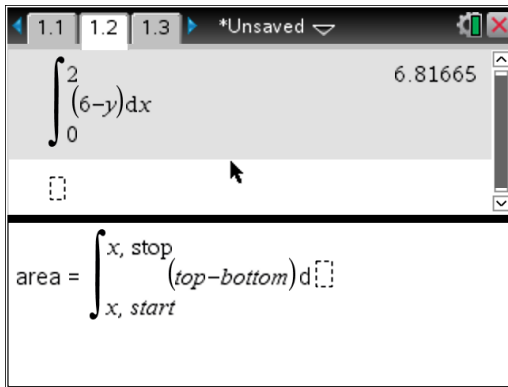


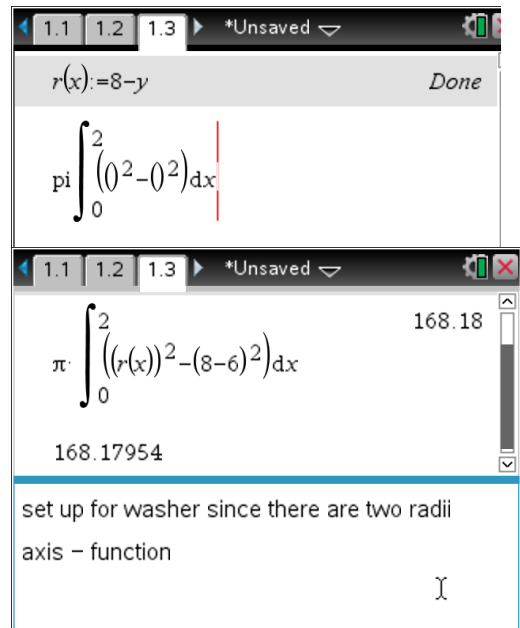
1)



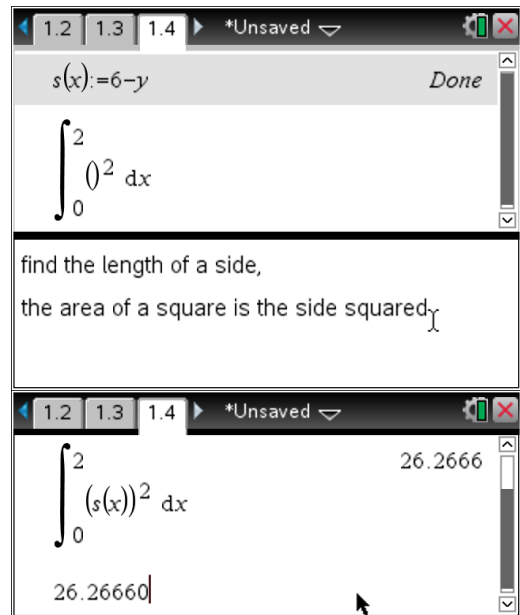
a.



b.



c.



2)

1.3 1.4 2.1 *Unsaved

$r(t) = 1380 \cdot t^2 - 675 \cdot t^3$ Done

$wI(t) = (2-t) \cdot r(t)$ Done

|

a.

1.4 2.1 2.2 *Unsaved

of people in auditorium when concert begins = # of people already there + number of people accumulated during time open to time start

$0 + \int_0^2 r(t) dt = 980$

|

b.

2.1 2.2 2.3 *Unsaved

solve($\frac{d}{dt}(r(t))=0, t$) $t=0$. or $t=1.36296$

$r(0)$	0
$r(1.36296)$	854.527
$r(2)$	120

to find max, take derivative and set equal to 0

c.

2.2 2.3 2.4 *Unsaved

FTC $w(2) - w(1) = \int_1^2 w'(t) dt$

$\int_1^2 wI(t) dt = 387.5$

387.49999

d.

2.3 2.4 2.5 *Unsaved

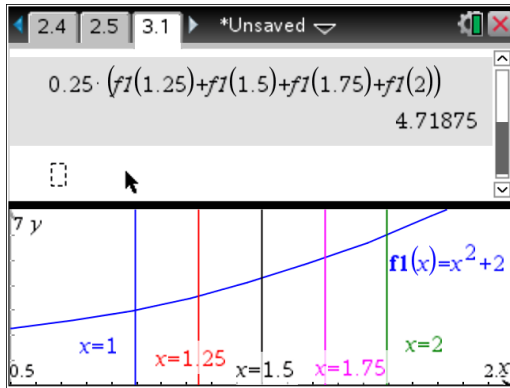
wait time per person units are TIME/PEOPLE

TIME = $\int \text{wait rate} dt$ over 2 hours

PEOPLE = $\int \text{people rate} dt$ (part a)

$\frac{\int_0^2 wI(t) dt}{\int_0^2 r(t) dt} = 0.77551$

3)



4)

$y = -2x + k$ is the tangent line, the slope is -2
 want the slope (derivative) $= -2$ at $x = ?$

$\text{solve}\left(\frac{d}{dx}(2 \cdot x^2 - 8 \cdot x + 14) = -2, x\right) \quad x = \frac{3}{2}$

the tangent line is equal to the equation at $x = \frac{3}{2}$, plug in x and solve for k

$y = -2 \cdot x + k \mid x = \frac{3}{2} \quad y = k - 3$

$y = 2 \cdot x^2 - 8 \cdot x + 14 \mid x = \frac{3}{2} \quad y = \frac{13}{2}$

$\text{solve}\left(k - 3 = \frac{13}{2}, k\right) \quad k = \frac{19}{2}$

5)

$\text{solve}(-x + 5 \cdot y = 15, y) \quad y = \frac{x + 15}{5}$

the slope of the normal line is $1/5$ so the slope of the tangent line is -5

$\frac{d}{dx}(a \cdot x^2 + b \cdot x + c) \quad 2 \cdot a \cdot x + b$

when x is 0 (from the point $(0, 3)$) and the slope $2ax + b = -5$ what happens?
 $2 \cdot a \cdot 0 + b = -5 \rightarrow b = -5$
 only one answer with $-5x$

to find a and c we use the original equation plugging in b , $(0, 3)$ and $(1, 5)$ to create a system of equations

$\text{linSolve}\left(\begin{cases} 3 = a \cdot 0^2 - 5 \cdot 0 + c \\ 5 = a \cdot 1^2 - 5 \cdot 1 + c \end{cases}, \{a, c\}\right) \quad \{7, 3\}$

to solve the linear system menu->algebra->solve systems->solve system of equations using 2 variables, a and c . for the first equation plug in $(0, 3)$ and the second plug in $(1, 5)$