Please answer the questions in the space provided. If you run out of room, use the back of the page. Show all your work to receive credit. No books or note sheets are allowed for this quiz.

Name: ___Solutions___

1. (1 point) Use a calculator to find the definite integral

$$\int_1^3 2^x dx$$

accurate to three decimal places.

On a TI-83 or 84:

fn Int (2^x, x, 1, 3) ≈ $\boxed{8.656}$

2. (3 points) The velocity of a particle is given in the table below. The units of time t are seconds, and the units of velocity $v(t)$ are meters per second.

t	0	5	10
$v(t)$	2	18	20

(a) Give a lower estimate for the change in the particle's position, and give units.

(b) Give an upper estimate for the change in position.

a) Using smaller number on each interval:

$(2\ ^m/_s)(5\ s)$ + $(18\ ^m/_s)(5\ s)$ = $\boxed{100\ m}$

b) Using larger number on each interval:

$(18\ ^m/_s)(5\ s)$ + $(20\ ^m/_s)(5\ s)$ = $\boxed{190\ m}$

3. (6 points) Consider the function $y = 2t$ for $0 \leq t \leq 3$.

(a) (2 points) Use left hand sums with $n = 3$ to estimate the area under the graph, and draw the rectangles whose areas represent this sum.

→ 3 rectangles

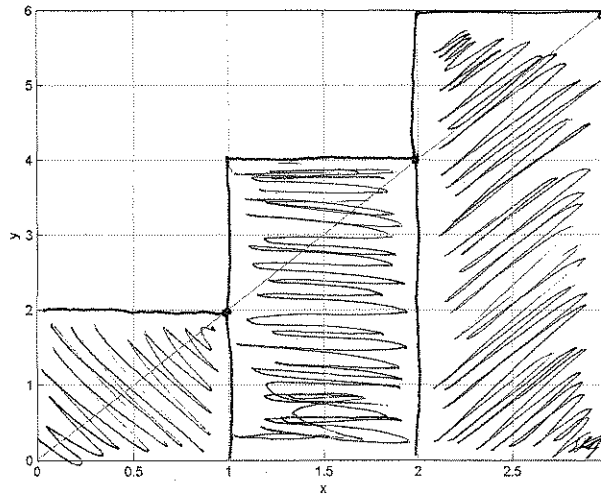$0 \cdot 1$

$+ 2 \cdot 1$

$+ 4 \cdot 1$

_____

6 units squared

(b) (2 points) Use right hand sums with $n = 3$ to estimate the area under the graph, and draw the rectangles whose areas represent this sum.

$2 \cdot 1$

$+ 4 \cdot 1$

$+ 6 \cdot 1$

_____
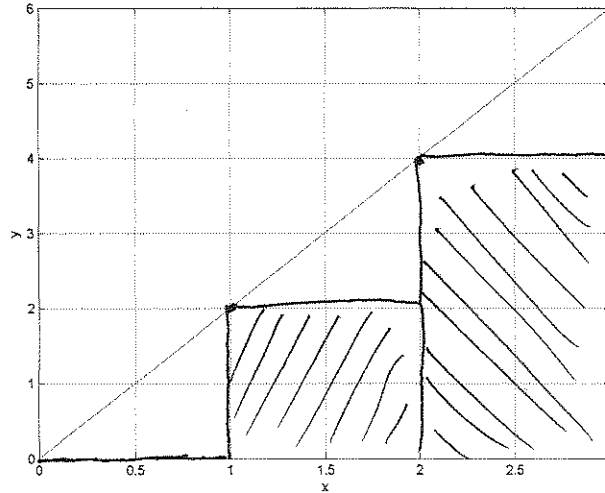
12 units squared

(c) (2 points) Find the exact value of the area under the curve.

Triangle: $\quad \frac{1}{2} \cdot 3 \cdot 6 =$ 9 units²

MTH 124 - Quiz 8
Version 2
25 October 2013

Please answer the questions in the space provided. If you run out of room, use the back of the page. Show all your work to receive credit. No books or note sheets are allowed for this quiz.

Name: _____Solutions_____

1. (1 point) Use a calculator to find the definite integral

$$\int_1^3 3^x \, dx$$

accurate to three decimal places.

On a TI - 83 or 84 :

fn Int $\left(3^x, x, 1, 3 \right) \approx \boxed{21.846}$

2. (3 points) The velocity of a particle is given in the table below. The units of time t are seconds, and the units of velocity $v(t)$ are meters per second.

t	0	5	10
$v(t)$	3	12	22

(a) Give a lower estimate for the change in the particle's position, and give units.

(b) Give an upper estimate for the change in position.

a) (Velocity increasing.) Using smaller number for each interval:

$(5 \text{ s})(3 \text{ m/s}) + (5 \text{ s})(12 \text{ m/s}) = \boxed{75 \text{ m}}$
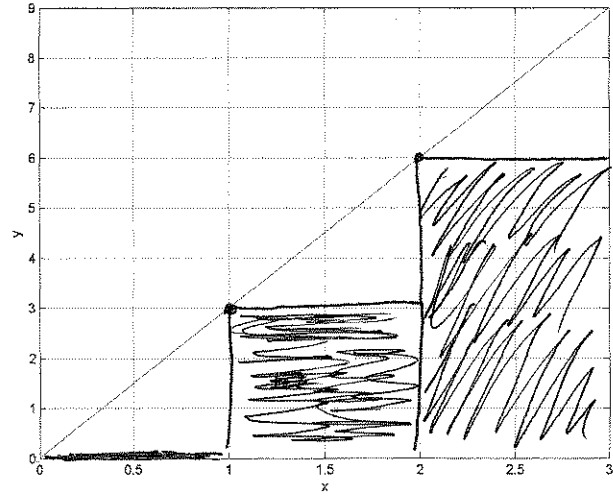
b) Using larger number:

$(5 \text{ s})(12 \text{ m/s}) + (5 \text{ s})(22 \text{ m/s}) = \boxed{170 \text{ m}}$

3. (6 points) Consider the function $y = 3t$ for $0 \le t \le 3$.

    (a) (2 points) Use left hand sums with $n = 3$ to estimate the area under the graph, and draw the rectangles whose areas represent this sum.
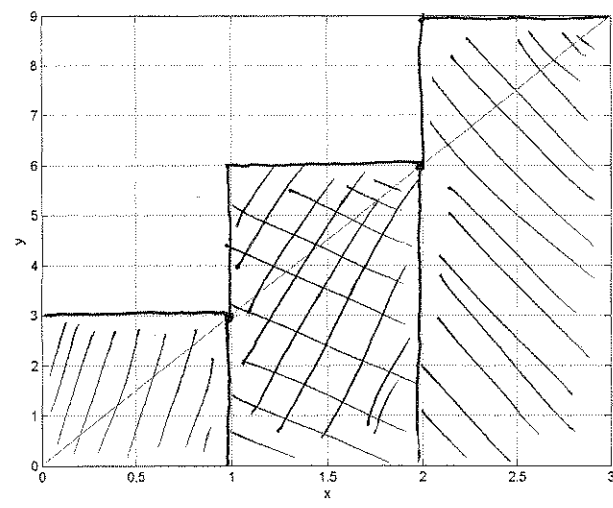
3 rectangles

$0 \cdot 1$

$+ \; 3 \cdot 1$

$+ \; 6 \cdot 1$

9 units squared

    (b) (2 points) Use right hand sums with $n = 3$ to estimate the area under the graph, and draw the rectangles whose areas represent this sum.

$3 \cdot 1$

$+ \; 6 \cdot 1$

$+ \; 9 \cdot 1$

18 units squared.

    (c) (2 points) Find the exact value of the area under the curve.

Triangle: $\quad \frac{1}{2} \cdot 3 \cdot 9 = $ 13.5 units^2