Section 5.6: The Area Between Two Curves (Minimum Homework: 1 – 19 odds)

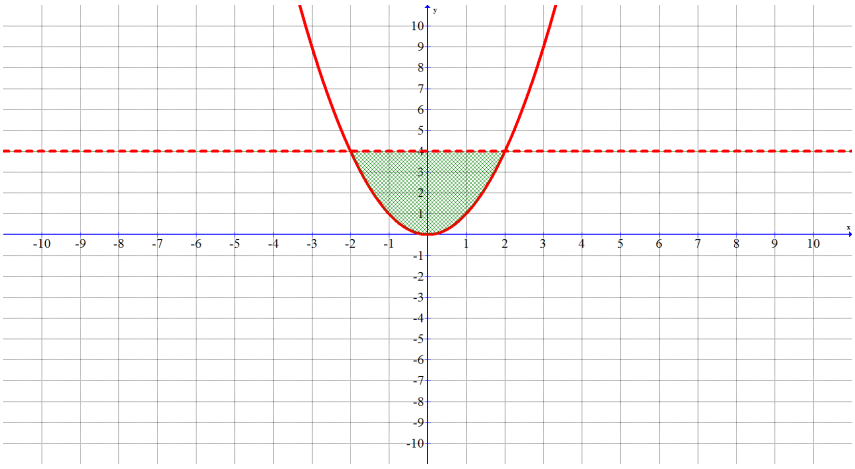
#1 – 10:

a) Create the integral needed to find the shaded area

b) Find the shaded area. Round to 2 decimals as needed. (you may use your calculator to determine the area)

The function whose graph is represented by the dashed is f(x) = 4

The function whose graph is represented by the solid line is g(x) = x^2



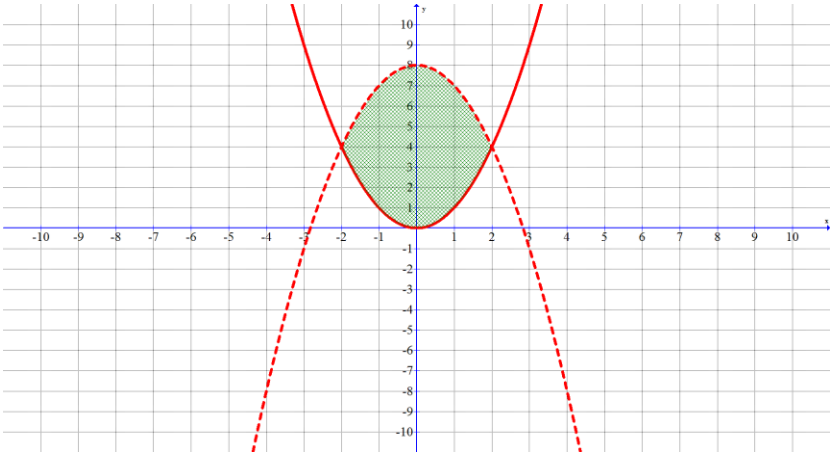
1a) $\int_{-2}^{2}(4-x^2)dx$

1b) 10.67

3) Find the shaded area.

The function whose graph is represented by the dashed is $f(x) = -x^2 + 8$

The function whose graph is represented by the solid line is $g(x) = x^2$



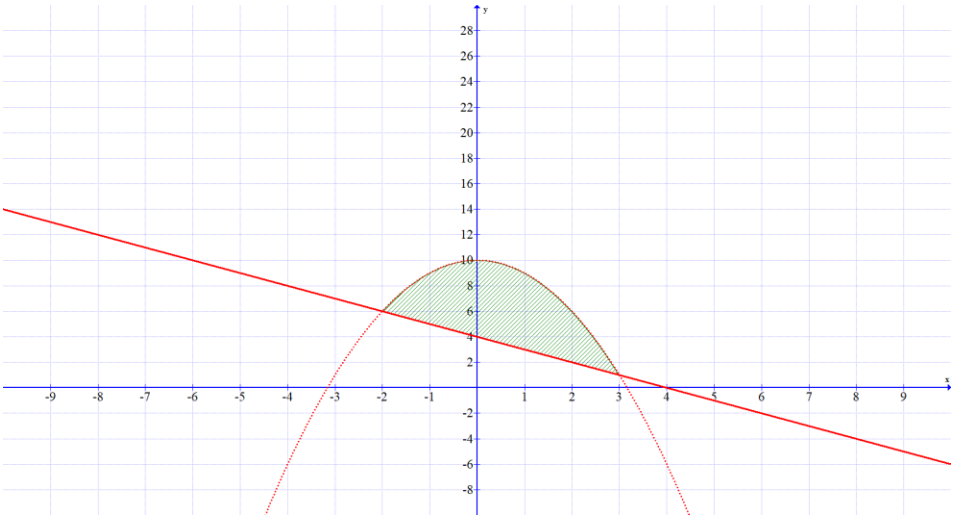
3a) $\int_{-2}^{2}(-x^2 + 8 - x^2)dx = \int_{-2}^{2}(-2x^2 + 8)dx$

3b) 21.33

5) Find the shaded area.

The function whose graph is represented by the dashed is $f(x) = -x^2 + 10$

The function whose graph is represented by the solid line is $g(x) = -x + 4$



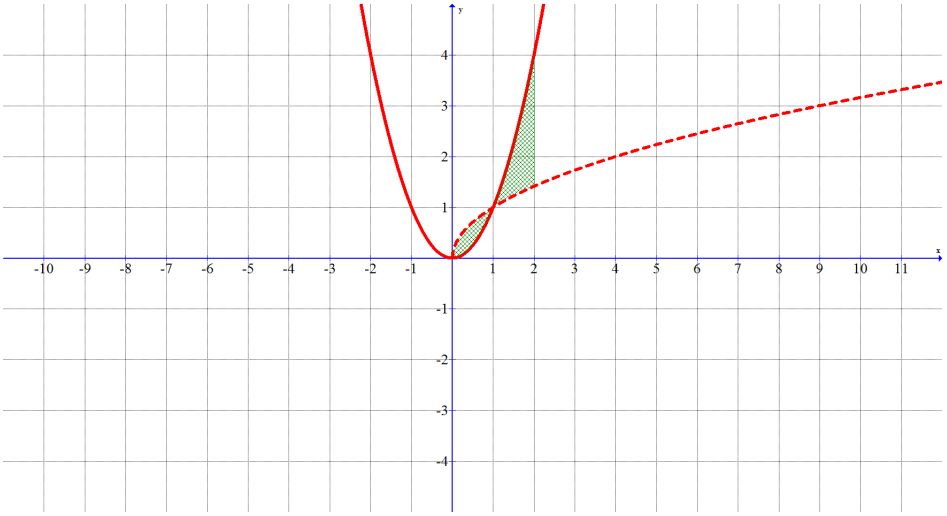
5a) $\int_{-2}^{3}(-x^2 + 10) - (-x + 4)dx = \int_{-2}^{3}(-x^2 + 10 + x - 4)dx = \int_{-2}^{3}(-x^2 + x + 6)dx$

5b) 19.5

7) Find the shaded area.

The function whose graph is represented by the dashed is $f(x) = \sqrt{x}$

The function whose graph is represented by the solid line is $g(x) = x^2$



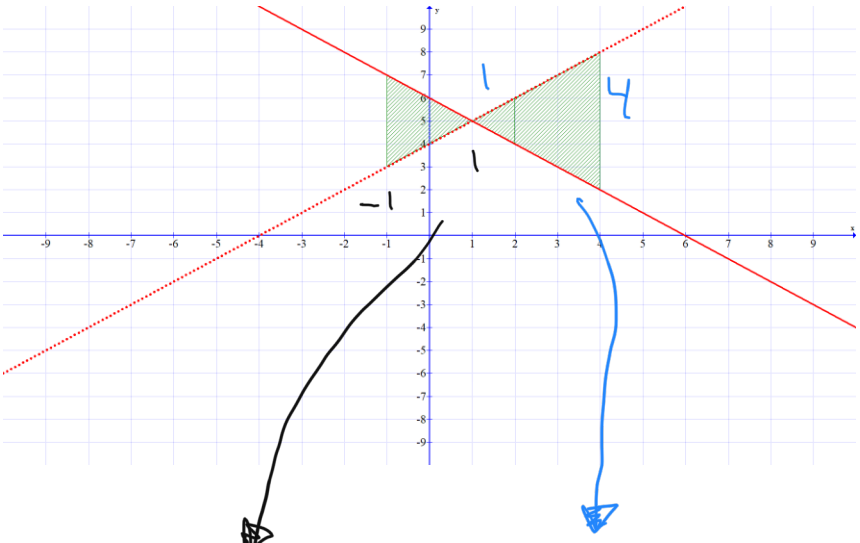
7a) $\int_0^1 (\sqrt{x} - x^2)dx + \int_1^2 (x^2 - \sqrt{x})dx$

7b) $0.33 + 1.11 = 1.44$

9) Find the shaded area.

The function whose graph is represented by the dashed is $f(x) = x + 4$

The function whose graph is represented by the solid line is $g(x) = 6 - x$



9a) $\int_{-1}^{1}(6 - 1x) - (1x + 4)dx \quad + \quad \int_{1}^{4}(1x + 4) - (6 - 1x)dx$

$= \int_{-1}^{1}(6 - 1x - 1x - 4)dx + \int_{1}^{4}(1x + 4 - 6 + 1x)dx$

$= \int_{-1}^{1}(-2x + 2)dx \ + \int_{1}^{4}(2x - 2)dx$

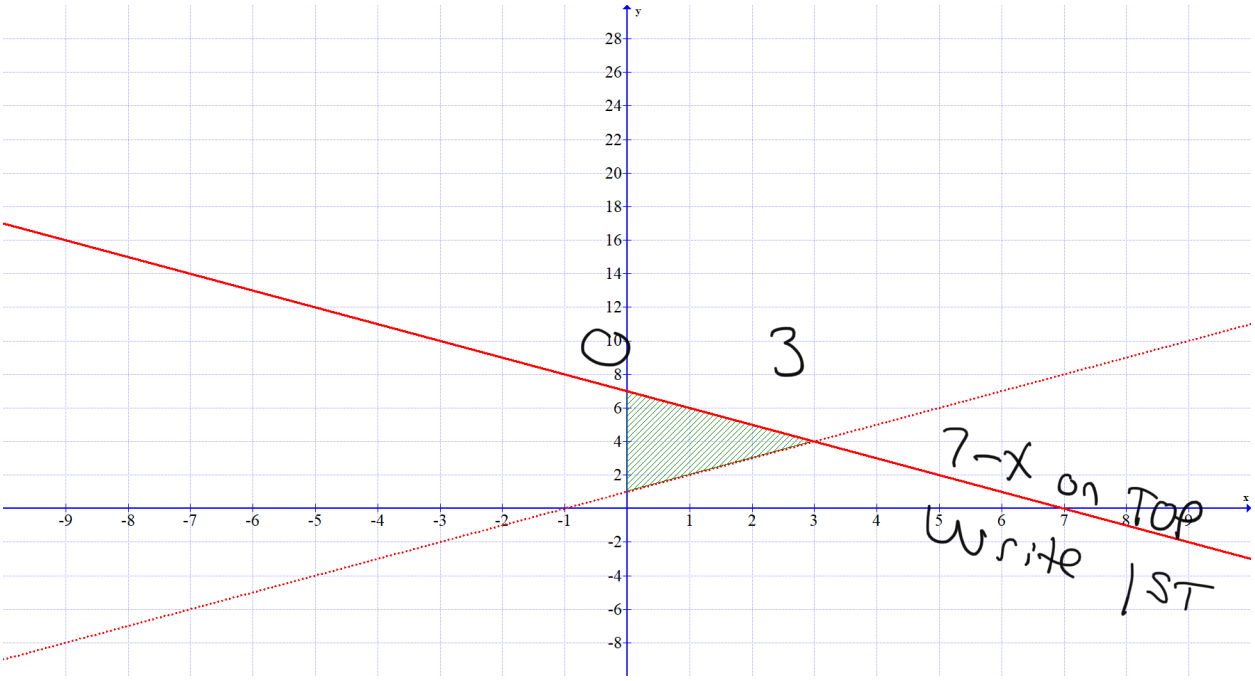
Calculator to compute integrals

9b) $4 + 9 = 13$

#11-16:

11) $f(x) = x + 1 \; and \; g(x) = 7 - x \; on \; [0,3]$.

a) Use a calculator to sketch a graph of both functions.
$f(x) = x + 1 \; dashed \; g(x) = 7 - x \;\; solid$



b) Determine the function that is the "top" function.

$g(x) \; is \; the$ "top" function in the shaded region

c) Create the integral needed to find the area between the curves.

$\int_0^3 (7 - x) - (x + 1)dx \;=\; \int_0^3 (7 - 1x - 1x - 1)dx \;\;=\;\; \int_0^3 (-2x + 6)dx$

compute on calculator

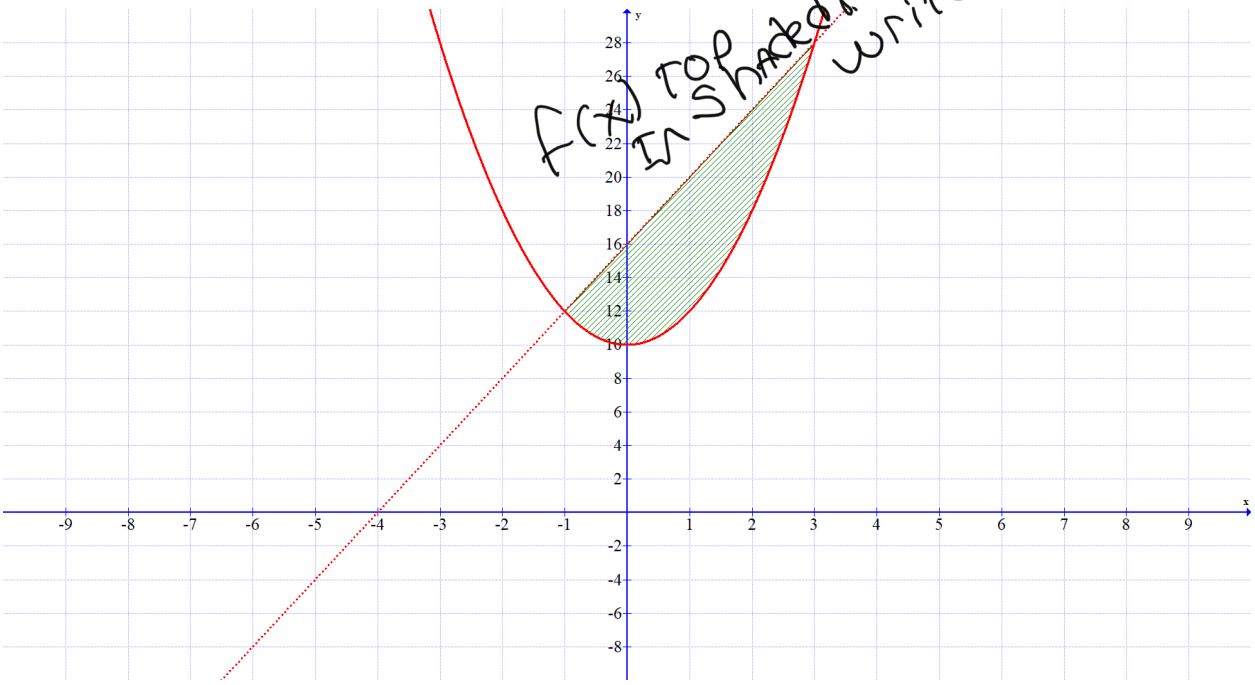
d) Find the area between the graphs over the given interval [a,b]
(You may use your calculator to compute the desired area.)

$area = 9$

13) $f(x) = 4x + 16 \; and \; g(x) = 2x^2 + 10 \; on \; [-1,3]$.

a) Use a calculator to sketch a graph of both functions.

$f(x) = 4x + 16 \; dashed \; g(x) = 2x^2 + 10 \; solid$



b) Determine the function that is the "top" function.

$f(x) = 4x + 16 \;\; is \; the$ top" $function$

c) Create the integral needed to find the area between the curves.

$\int_{-1}^{3}(4x + 16) - (2x^2 + 10)dx \;\; = \int_{-1}^{3}(4x + 16 - 2x^2 - 10)dx$

$= \int_{-1}^{3}(-2x^2 + 4x + 6)dx$

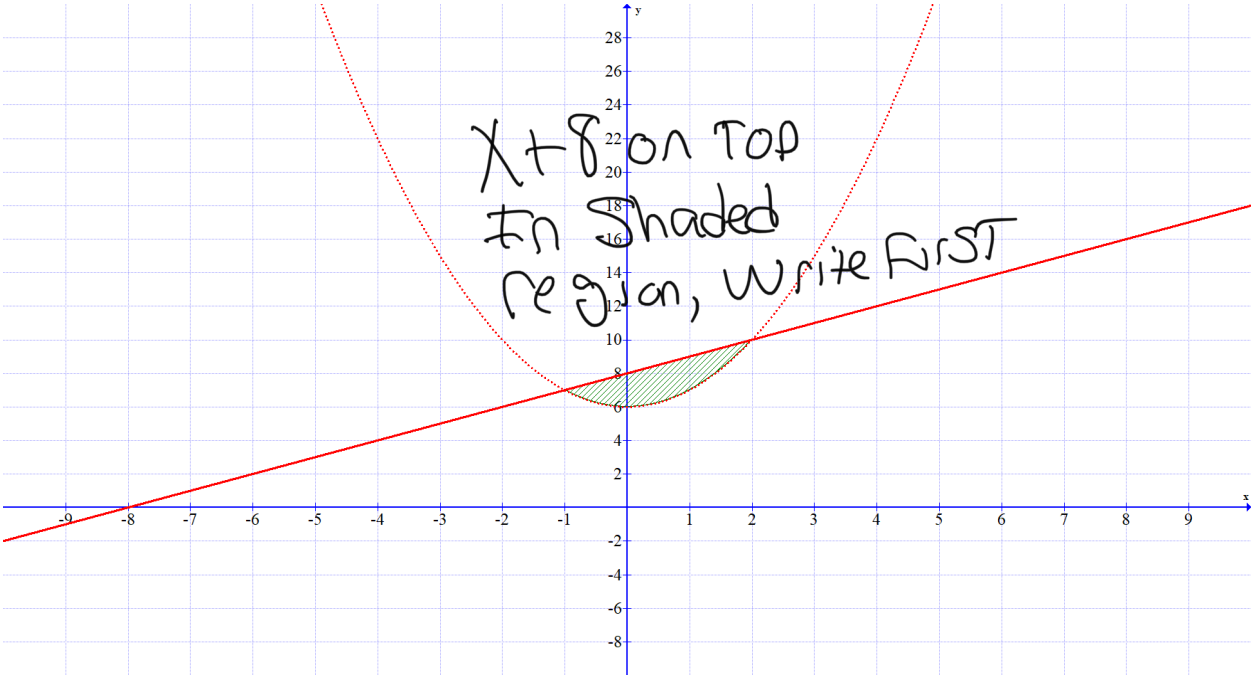
d) Find the area between the graphs over the given interval [a,b]
(You may use your calculator to compute the desired area.)

Area 21.33

15) $f(x) = x^2 + 6 \; and \; g(x) = x + 8 \; on \; [-1,2]$.

a) Use a calculator to sketch a graph of both functions.

$f(x) = x^2 + 6 \; dashed \; g(x) = x + 8 \; solid$



b) Determine the function that is the "top" function.

$g(x) = x + 8 \; is \; the \; top \; function.$

c) Create the integral needed to find the area between the curves.

$\int_{-1}^{2}(x + 8) - (x^2 + 6)dx \;\; = \int_{-1}^{2}(x + 8 - x^2 - 6)dx$

$\int_{-1}^{2}(-x^2 + x + 2)dx$

d) Find the area between the graphs over the given interval [a,b]
(You may use your calculator to compute the desired area.)

area 4.5