1. **(1 point)** `Library/Wiley/setAnton_Section_6.1/anton_6_1_Q13.pg`

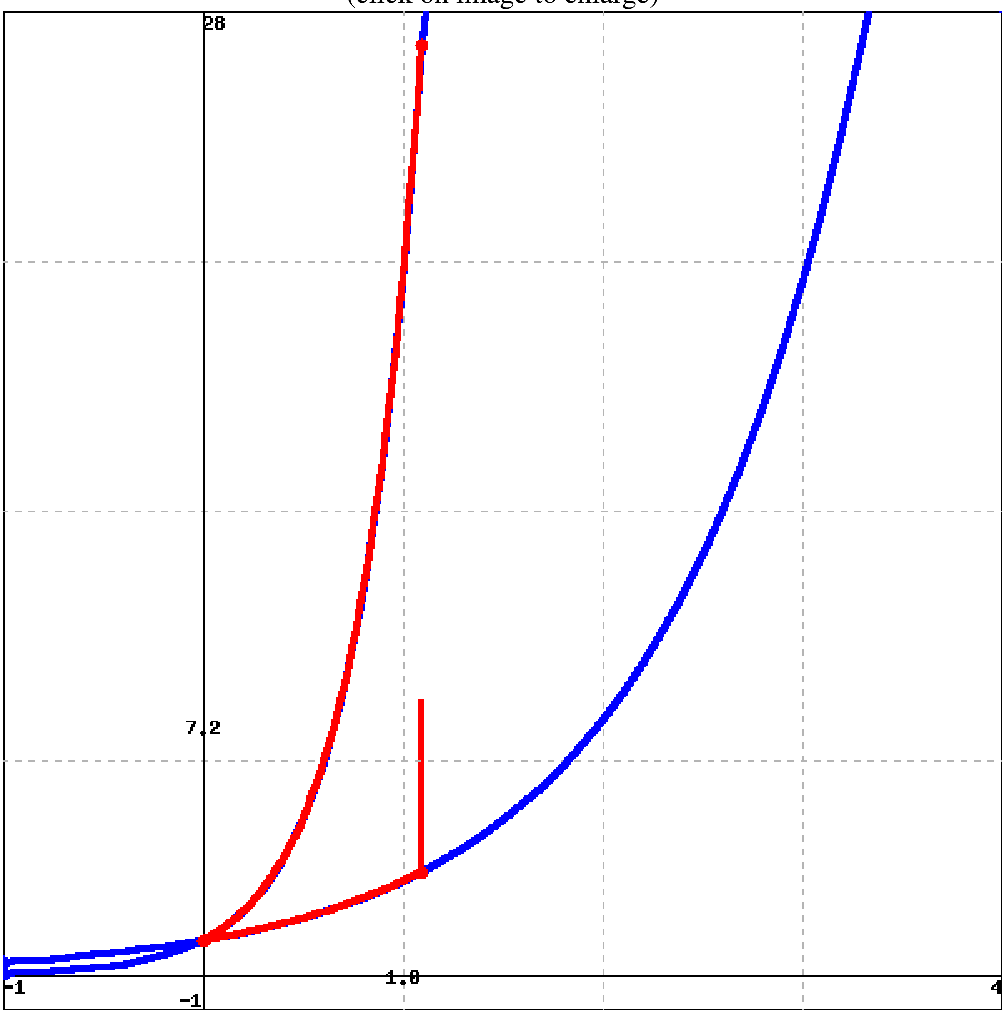
Sketch the region enclosed by the curves and find its area.
$y = e^x,\ y = e^{3x},\ x = 0,\ x = \ln 3$
AREA = ________
Solution: *(Instructor solution preview: show the student solution after due date.)*

SOLUTION
Area

$$= \int_0^{\ln 3} \left[e^{3x} - e^x\right]\, dx = \left[\frac{e^{3x}}{3} - e^x\right]_0^{\ln 3} = \left(\frac{3^3}{3} - 3\right) - \left(\frac{1^3}{3} - 1\right) = \frac{20}{3}$$

The area between the curves is $\frac{20}{3}$.

(click on image to enlarge)



Correct Answers:

- 20/3

2. **(1 point)** `Library/Wiley/setAnton_Section_6.1/anton_6_1_Q18.pg`

Sketch the region enclosed by the curves and find its area.

$y = x,\ y = 4x,\ y = -x+4$

AREA = ________

Solution: *(Instructor solution preview: show the student solution after due date.)*

SOLUTION

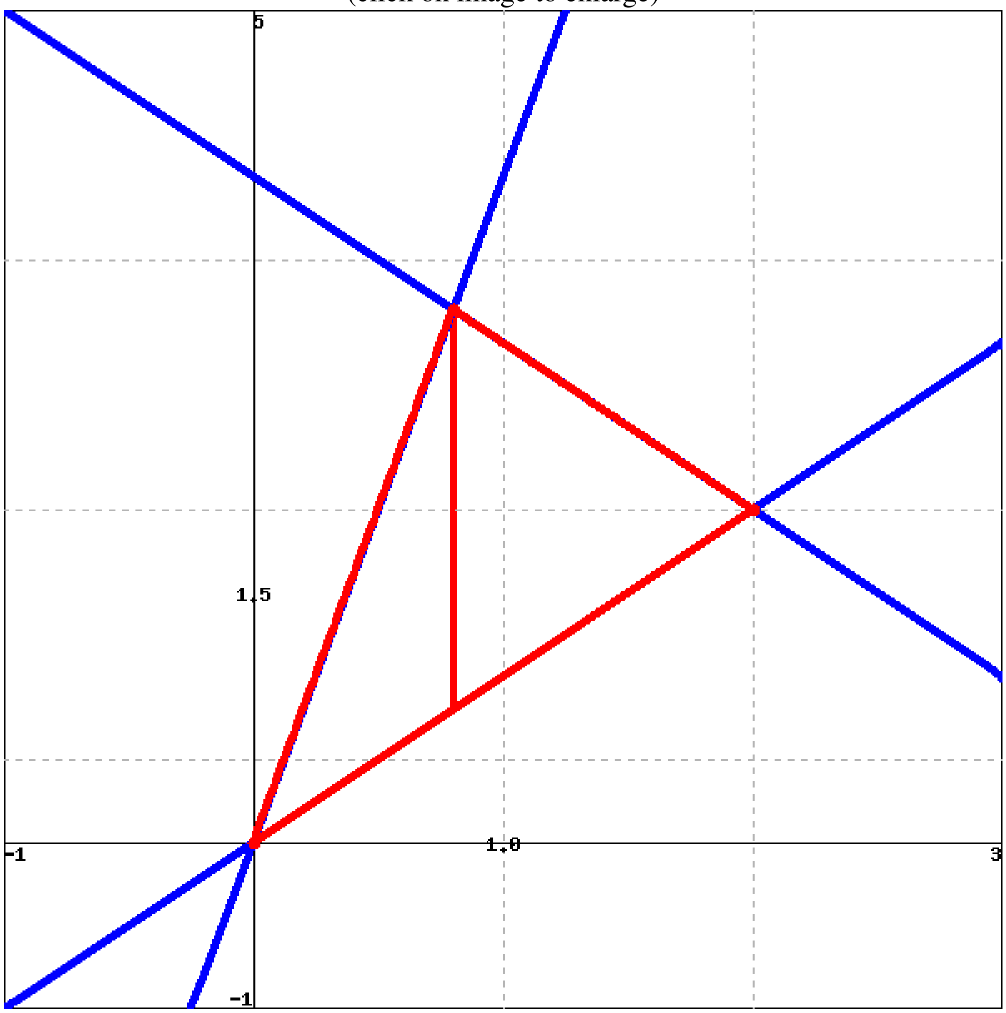
Here we need to break the region into two parts, since the top curve changes from $y = 4x$ to $y = -x+4$ at the point where $4x = -x+4$ $\left(x = \frac{4}{5}\right)$.

Area

$$= \int_0^{\frac{4}{5}} [4x - x]\ dx + \int_{\frac{4}{5}}^{2} [-x+4-x]\ dx = \left[\frac{3x^2}{2}\right]_0^{\frac{4}{5}} + \left[-x^2+4x\right]_{\frac{4}{5}}^{2} = \left(\tfrac{24}{25}\right) - (0) + (4) - \left(\tfrac{64}{25}\right) = \frac{12}{5}$$

The area between the curves is $\frac{12}{5}$.

(click on image to enlarge)



Correct Answers:

- `2.4`

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3. **(1 point)** `Library/Wiley/setAnton_Section_6.1/anton_6_1_Q37a.pg`

Find the area of the region enclosed by the parabola $y = 5x - x^2$ and the x-axis.

AREA = ________

Solution: *(Instructor solution preview: show the student solution after due date.)*

SOLUTION

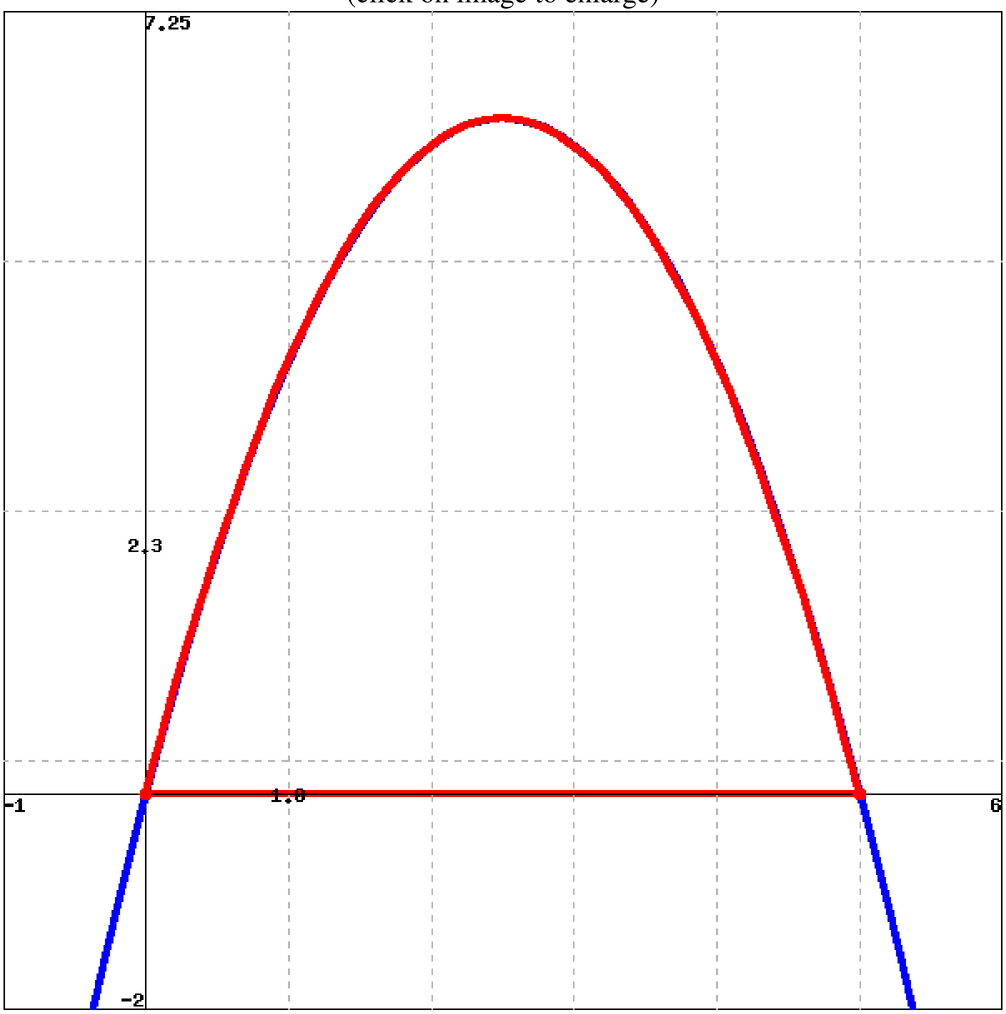
$y = 5x - x^2$ intersects the x-axis at $x = 0$, $x = 5$ and these will provide the limits of integration over the function $y = 5x - x^2$.

Area

$$= \int_0^5 \left[5x - x^2\right]\, dx = \left[\frac{5x^2}{2} - \frac{x^3}{3}\right]_0^5 = \left(\tfrac{125}{6}\right) - (0) = \tfrac{125}{6}$$

The area between the curves is $\frac{125}{6}$.

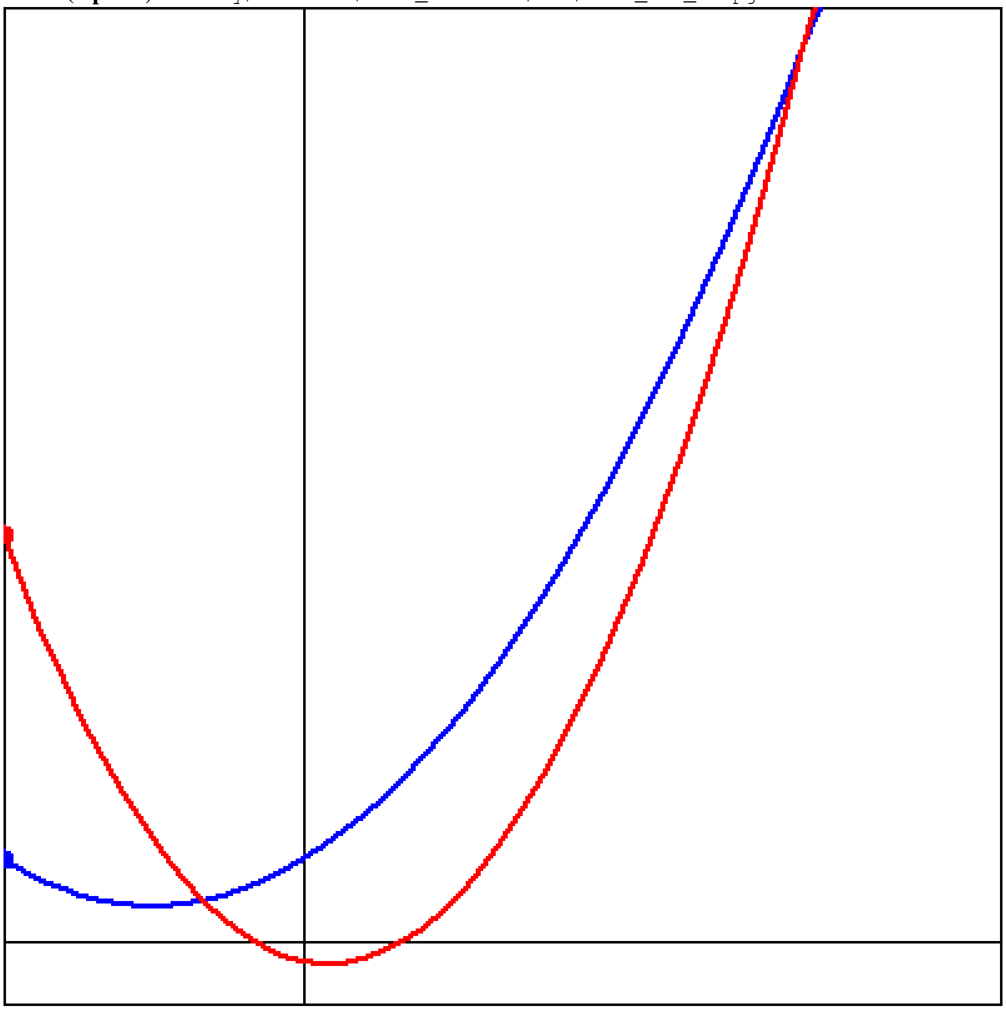
(click on image to enlarge)



Correct Answers:

- `20.8333`

4. **(1 point)** `Library/Valdosta/APEX_Calculus/5.4/APEX_5.4_52.pg`



Find the area of the region enclosed between $f(x) = x^2 + 3x + 4$ and $g(x) = 2x^2 - x - 1$.

Area = ________

(**Note:** The graph above represents both functions f and g but is intentionally left unlabeled.)

Solution: *(Instructor solution preview: show the student solution after due date.)*

Solution:

The area between curves is found using the definite integral $\int_a^b (f(x) - g(x))\, dx$. First determine the points of intersection by solving:

$$x^2 + 3x + 4 = 2x^2 - x - 1 \Rightarrow \cdots \Rightarrow x = -1, 5.$$

$$\begin{aligned} \text{Area} &= \int_{-1}^{5} \left((x^2 + 3x + 4) - (2x^2 - x - 1)\right) dx \\ &= \int_{-1}^{5} \left(-x^2 + 4x + 5\right) dx \\ &= \left(-\frac{x^3}{3} + \frac{4x^2}{2} + 5x\right)\Big|_{-1}^{5} \\ &= 36 \end{aligned}$$

Correct Answers:

- `36`

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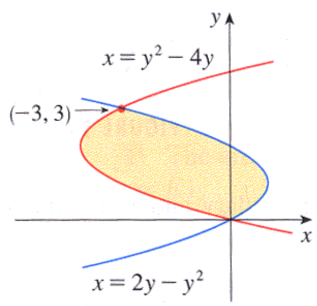
5. (1 point) `Library/UCSB/Stewart5_6_1/Stewart5_6_1_4/Stewart5_6_1_4.pg`

Find the area of the shaded region below.



Area = ______________

Correct Answers:

- `9`

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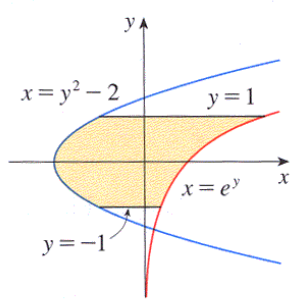
6. (1 point) `Library/UCSB/Stewart5_6_1/Stewart5_6_1_3/Stewart5_6_1_3.pg`

Find the area of the shaded region below.



Area = ______________

Correct Answers:

- `exp(1)-1/exp(1)+10/3`

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7. (1 point) `Library/UCSB/Stewart5_6_1/Stewart5_6_1_18.pg`

Find the area of the region between the curves $4x + y^2 = 12$ and $x = y$.
Area between curves = ______________

Correct Answers:

- `64/3`

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8. (1 point) `Library/UMN/calculusStewartCCC/s_6_1_9.pg`
Sketch the region enclosed by the curves $x = 49 - y^2$ and $x = y^2 - 49$. Decide whether to integrate with respect to x or y. Then find the area of the region.
Area = __________

Correct Answers:

- `8*7^3/3`