WebAssign
Hw 8 (6.4, 6.5): Work and Average of Functions (Homework)

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MA 162 Spring 2012, section 321, Spring 2012
Instructor: Jonathan Montano

Current Score : 20 / 20 **Due :** Tuesday, January 31 2012 11:55 PM EST

1. 2.5/2.5 points | Previous Answers SCalcET7 6.4.003.

A variable force of $4x^{-2}$ pounds moves an object along a straight line when it is x feet from the origin. Calculate the work done in moving the object from $x = 1$ ft to $x = 11$ ft. (Round your answer to two decimal places.)

40/11 ✓ ft-lb

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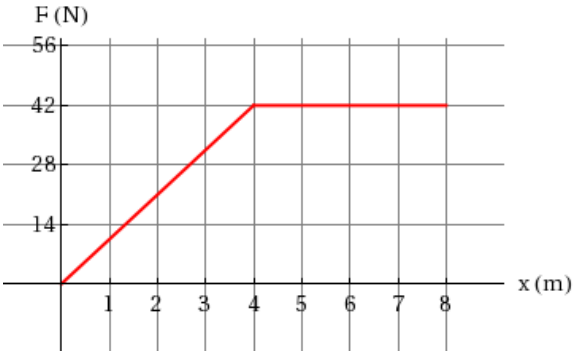
2. 2.5/2.5 points | Previous Answers SCalcET7 6.4.005.

Shown is the graph of a force function (in newtons) that increases to its maximum value and then remains constant. How much work W is done by the force in moving an object a distance of 8 m?

$W =$ 252 ✓ J



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3. 2.5/2.5 points | Previous Answers SCalcET7 6.4.007.MI.

A force of 10 lb is required to hold a spring stretched 8 in. beyond its natural length. How much work W is done in stretching it from its natural length to 13 in. beyond its natural length?

$W =$ 2535/288 ✓ ft-lb

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4. 2.5/2.5 points | Previous Answers SCalcET7 6.4.010.

If the work required to stretch a spring 3 ft beyond its natural length is 12 ft-lb, how much work is needed to stretch it 27 in. beyond its natural length?

6.75 ✓ ft-lb

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5. 2.5/2.5 points | Previous Answers SCalcET7 6.4.019.

An aquarium 6 m long, 1 m wide, and 1 m deep is full of water. Find the work needed to pump half of the water out of the aquarium. (Use 9.8 m/s^2 for g and the fact that the density of water is 1000 kg/m^3.)

Show how to approximate the required work by a Riemann sum. (Enter x_i^* as x_i.)

$$\lim_{n \to \infty} \sum_{i=1}^{n} \left(\checkmark \right) \Delta x$$

Express the work as an integral.

$\int_0^{1/2} (\quad) \, dx$

Evaluate the integral.

7350 J

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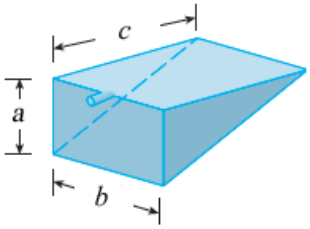
6. 2.5/2.5 points | Previous Answers SCalcET7 6.4.024.

A tank is full of water. Find the work required to pump the water out of the spout. Use the fact that water weighs 62.5 lb/ft^3. (Assume a = 3 ft, b = 6 ft, and c = 8 ft.)

ft-lb



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7. 2.5/2.5 points | Previous Answers SCalcET7 6.5.009.

Consider the given function and the given interval.

$f(x) = (x - 3)^2, \quad [2, 5]$

(a) Find the average value f_{ave} of f on the given interval.

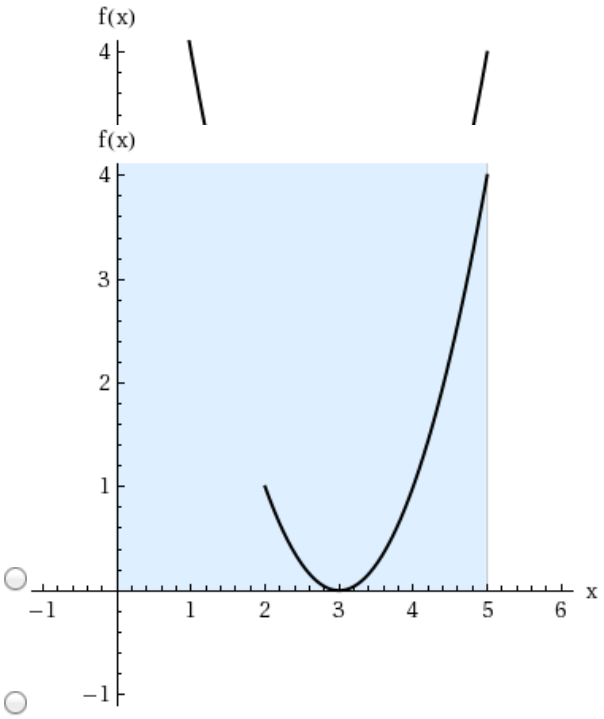
f_{ave} =

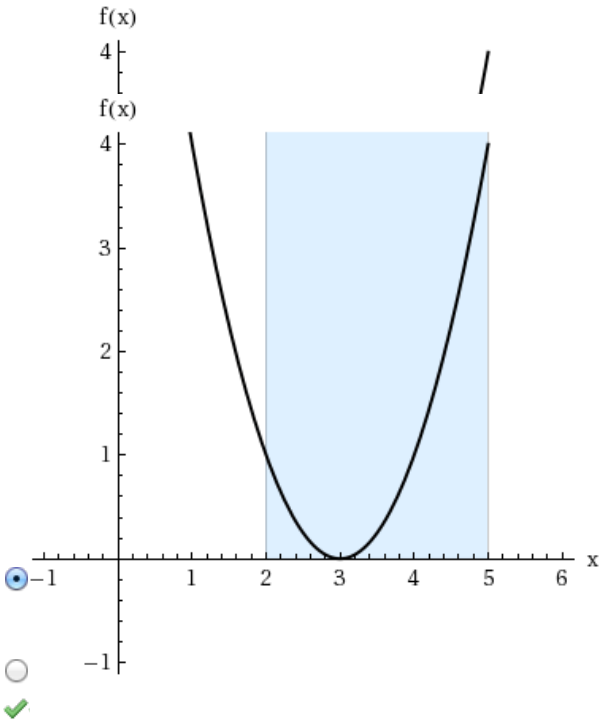
(b) Find c such that $f_{ave} = f(c)$.

c = 2 (smaller value)

c = 4 (larger value)

(c) Sketch the graph of f and a rectangle whose area is the same as the area under the graph of f.





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8. 2.5/2.5 points | Previous Answers SCalcET7 6.5.017.MI.

In a certain city the temperature (in °F) t hours after 9 AM was modeled by the function

$$T(t) = 56 + 15 \sin \frac{\pi t}{12}.$$

Find the average temperature T_{ave} during the period from 9 AM to 9 PM. (Round your answer to the nearest whole number.)

T_{ave} = 65.55 °F

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