

14. The force acting on a particle varies as shown in Figure P7.14. Find the work done by the force on the particle as it moves (a) from  $x = 0$  to  $x = 8.00$  m, (b) from  $x = 8.00$  m to  $x = 10.0$  m, and (c) from  $x = 0$  to  $x = 10.0$  m.

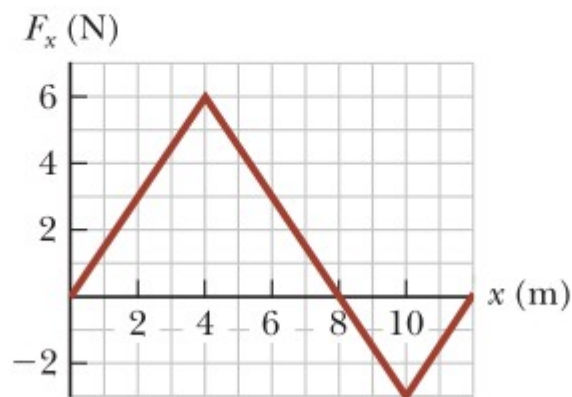


Figure P7.14

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17. When a 4.00-kg object is hung vertically on a certain light spring that obeys Hooke's law, the spring stretches 2.50 cm. If the 4.00-kg object is removed, (a) how far will the spring stretch if a 1.50-kg block is hung on it? (b) How much work must an external agent do to stretch the same spring 4.00 cm from its unstretched position?

Name: \_\_\_\_\_

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25. A force  $\vec{F} = (4x\hat{i} + 3y\hat{j})$ , where  $\vec{F}$  is in newtons and  $x$  and  $y$  are in meters, acts on an object as the object moves in the  $x$  direction from the origin to  $x = 5.00$  m. Find the work  $W = \int \vec{F} \cdot d\vec{r}$  done by the force on the object.

Name: \_\_\_\_\_

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28. A 100-g bullet is fired from a rifle having a barrel 0.600 m long. Choose the origin to be at the location where the bullet begins to move. Then the force (in newtons) exerted by the expanding gas on the bullet is  $15\,000 + 10\,000x - 25\,000x^2$ , where  $x$  is in meters. (a) Determine the work done by the gas on the bullet as the bullet travels the length of the barrel. (b) **What If?** If the barrel is 1.00 m long, how much work is done, and (c) how does this value compare with the work calculated in part (a)?