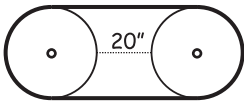
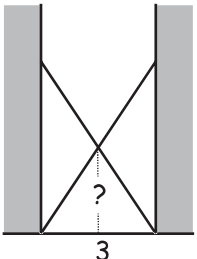


# Workout 4

1. \_\_\_\_\_ mph A car that is traveling 90 feet per second is traveling how many miles per hour? There are 5280 feet in 1 mile. Express your answer to the nearest whole number.
2. \_\_\_\_\_ The product  $(66)(9)(22)(39)$  has a prime factorization of the form  $(2^a)(3^b)(11^c)(13^d)$ . What is the value of  $ac - bd$ ?
3. \_\_\_\_\_ inches Tony the Tortoise walked 10 inches during the first hour of his journey. He walked one and one-half times that distance during the second hour, and in general during the  $n^{\text{th}}$  hour he walked  $(1 + \frac{1}{n})$  times the distance walked during the  $n-1^{\text{st}}$  hour. How many inches did Tony walk during the first three hours of his journey?
4. \$ \_\_\_\_\_ Big Town Auto totaled \$437,184 in revenue in August. August's revenue was 8% greater than July's revenue. July's revenue was 12% below the revenue for June. What was the revenue for June?
5. \_\_\_\_\_ Let  $B(n)$  denote the sum of the digits of the binary (base 2) representation of  $n$ . Let  $T(n)$  denote the sum of the digits of the ternary (base 3) representation of  $n$ . For example,  $B(9) = B(1001_2) = 2$  and  $T(9) = T(100_3) = 1$ . What is the smallest positive integer  $n$  greater than 1 such that  $B(n) = T(n)$ ?
6. \_\_\_\_\_ items Jordan buys pens for \$3 each and books for \$5 each, totaling exactly \$2008. What is the largest number of items (pens plus books) he could have bought?
7. \_\_\_\_\_ blades Terrell wondered how many blades of grass were in his 60-foot by 90-foot rectangular backyard. He picked a square region three inches on a side, which contained 520 blades of grass. If the grass was uniformly distributed throughout the backyard, how many blades were in the entire backyard?
8. \_\_\_\_\_ inches  Each circular pulley shown has a radius of 12 inches. The shortest distance between the pulleys is 20 inches. What is the length of the continuous belt that loops around both pulleys? Express your answer to the nearest whole number.
9. \_\_\_\_\_ meters Two ladders, both 6 meters in length, are leaned up against opposite vertical walls in a 3-meter-wide corridor, as shown. How far above the ground do the two ladders cross? Express your answer as a decimal to the nearest tenth. 
10. \_\_\_\_\_ questions To pass a 30-question test, Johnny needs to answer at least 60% of the questions correctly. When Johnny received his graded test back, he saw that he needed to have answered exactly two more questions correctly to have passed the test. How many questions did he answer correctly?