

HOMEWORK EXERCISES (TIME: 10 MINUTES)

21. A man left his house and walked two miles. He then waited for the bus for exactly half the number of minutes he spent walking. The bus home traveled at a speed of 10 miles per hour along the same route he walked. If he arrived home exactly an hour after he left, what was his walking speed to the nearest tenth of a mile per hour?
- (A) 0.3
(B) 2.2
(C) 2.4
(D) 3.8
(E) 18
22. In triangles $\triangle ABC$ and $\triangle DEF$, $m\angle C = m\angle F = 90^\circ$, $AC:DF = 3:5$, and $BC:EF = 10:3$. What is the ratio of the area of $\triangle ABC$ to the area of $\triangle DEF$?
- (A) 9:50
(B) 1:1
(C) 5:3
(D) 2:1
(E) 4:1
23. Astor can walk 6 kilometers in an hour and 24 minutes. At this rate, how many meters can she walk in 21 seconds?
- (A) 0.25
(B) 2.5
(C) 25
(D) 35
(E) 1500
24. At a juice factory, lemonade is made in a giant vat into which three faucets continuously pour water, lemon juice, and sugar, respectively, in a ratio of 3:1:1. If there are 288 gallons of water, 108 gallons of sugar, and 120 gallons of lemon juice, which ingredient will the factory run out of first?
- (A) Water
(B) Sugar
(C) Lemon juice
(D) Sugar and lemon juice at the same time
(E) Water and sugar at the same time
25. Rania rows 12 miles across a lake and 12 miles back. On the way out, she goes 2 miles per hour faster than she does on the return trip. The initial trip across takes t hours, while the return trip takes $t + 1$ hours. How many hours does the entire trip out and back take?
- (A) 2
(B) 3
(C) 5
(D) 6
(E) 11
26. If 5 students can write 6 essays in 8 hours, how many *minutes* will it take 4 students to write 3 essays?
- (A) 5
(B) 20
(C) 180
(D) 192
(E) 300
27. The cost of posters at a print shop is c cents per copy for the first 200 copies, then drops to $c - 5$ cents per copy for any additional copies. Which of the following equations expresses the cost C in cents of printing k copies, where $k > 200$?
- (A) $C = k(c - 5) + 1000$
(B) $C = (k - 200)c + 200$
(C) $C = (k - 200)(c - 5)$
(D) $C = k(c - 5) + 200$
(E) $C = kc - 5(200 - k)$
28. A country's rice consumption in 2010 was K kilograms for each of its P people. In 2011, the population increased by I people, and per capita rice consumption decreased by X percent because of an increased preference for foods made from wheat and other grains. Which of the following expressions is equal to the ratio of the country's total rice consumption in 2011 to that of 2010?
- (A) $\frac{I(100-X)}{100P}$
(B) $\frac{K(P+I)(100-X)}{100P}$
(C) $\frac{X(P+I)}{100KP}$
(D) $\frac{(P+I)(100-X)}{100P}$
(E) $\frac{IX}{100P}$

29. A sphere is inscribed in a cube of side length 6. What is the ratio of the volume of the sphere to that of the cube?

(A) $\frac{\pi}{6}$
(B) $\frac{\pi}{3\sqrt{3}}$
(C) $\frac{\pi}{4}$
(D) $\frac{\pi}{3}$
(E) $\frac{\pi}{\sqrt{3}}$

30. Larry and Curley can build a house in 18 hours. Larry and Moe can do it in 12 hours. Curley and Moe can do it in 9 hours. How many hours would it take the three of them working together to build the house?

(A) 4
(B) 8
(C) 13
(D) 19.5
(E) 39