UNIT 5 EXERCISES 1-5

SPEED/TIME

2011A

1. **Answer (C):** The given expression is equal to

$$\frac{12}{9} - \frac{9}{12} = \frac{4}{3} - \frac{3}{4} = \frac{16-9}{12} = \frac{7}{12}.$$

2017B

1. **Answer (E):** After m months, Kymbrea's collection will have $30 + 2m$ comic books and LaShawn's collection will have $10 + 6m$ comic books. Solving $10 + 6m = 2(30 + 2m)$ yields $m = 25$, so LaShawn's collection will have twice as many comic books as Kymbrea's after 25 months.

2007B

2. **Answer (B):** The student used $120/30 = 4$ gallons on the trip home and $120/20 = 6$ gallons on the trip back to school. So the average gas mileage for the round trip was

$$\frac{240 \text{ miles}}{10 \text{ gallons}} = 24 \text{ miles per gallon.}$$

2009B

2. **Answer (C):** The loss of 3 cans of paint resulted in 5 fewer rooms being painted, so the ratio of cans of paint to rooms painted is $3 : 5$. Hence for 25 rooms she would require $\frac{3}{5} \cdot 25 = 15$ cans of paint.

OR

If she used x cans of paint for 25 rooms, then $\frac{x+3}{30} = \frac{x}{25}$. Hence $25x + 75 = 30x$, and $x = 15$.

2012A

2. **Answer (D):** Because 20 seconds is $\frac{1}{3}$ of a minute, Cagney can frost $5 \div \frac{1}{3} = 15$ cupcakes in five minutes. Because 30 seconds is $\frac{1}{2}$ of a minute, Lacey can frost $5 \div \frac{1}{2} = 10$ cupcakes in five minutes. Altogether they can frost $15 + 10 = 25$ cupcakes in five minutes.

2018B

2. **Answer (D):** Sam covered $\frac{1}{2} \cdot 60 = 30$ miles during the first 30 minutes and $\frac{1}{2} \cdot 65 = 32.5$ miles during the second 30 minutes, so he needed to cover $96 - 30 - 32.5 = 33.5$ miles during the last 30 minutes. Thus his average speed during the last 30 minutes was

$$\frac{33.5 \text{ miles}}{\frac{1}{2} \text{ hour}} = 67 \text{ mph.}$$

2014B

3. **Answer (E):** The fraction of Randy's trip driven on pavement was $1-\frac{1}{3}-\frac{1}{5}=\frac{7}{15}$. Therefore the entire trip was $20 \div \frac{7}{15}=\frac{300}{7}$ miles.

2003A

4. (A) Mary walks a total of 2 km in 40 minutes. Because 40 minutes is 2/3 hr, her average speed, in km/hr, is $2/(2/3)=3$.

2007A

4. **Answer (A):** Kate rode for 30 minutes = 1/2 hour at 16 mph, so she rode 8 miles. She walked for 90 minutes = 3/2 hours at 4 mph, so she walked 6 miles. Therefore she covered a total of 14 miles in 2 hours, so her average speed was 7 mph.

2014A

4. **Answer (A):** One cow gives $\frac{b}{a}$ gallons in c days, so one cow gives $\frac{b}{ac}$ gallons in 1 day. Thus d cows will give $\frac{bd}{ac}$ gallons in 1 day. In e days d cows will give $\frac{bde}{ac}$ gallons of milk.

2017B

4. **Answer (C):** Let $2d$ be the distance in kilometers to the friend's house. Then Samia bicycled distance d at rate 17 and walked distance d at rate 5, for a total time of

$$\frac{d}{17}+\frac{d}{5}=\frac{44}{60}$$

hours. Solving this equation yields $d=\frac{17}{6}=2.833\ldots$. Therefore Samia walked about 2.8 kilometers.

2006B 5. **(A)** In order to catch up to John, Bob must walk 1 mile farther in the same amount of time. Because Bob's speed exceeds John's speed by $5 - 3 = 2$ miles per hour, the time required for Bob to catch up to John is $1/2$ hour, or 30 minutes.