UNIT 15 EXERCISES 6-10

PERCENT

2008A 6. **Answer (A):** Let x denote the sticker price, in dollars. Heather pays $0.85x-90$ dollars at store A and would have paid $0.75x$ dollars at store B. Thus the sticker price x satisfies $0.85x - 90 = 0.75x - 15$, so $x = 750$.

2010B

6. **Answer (D):** Assume there are 100 students in Mr. Wells' class. Then at least $70 - 50 = 20$ students answered "No" at the beginning of the school year and "Yes" at the end, so $x \geq 20$. Because only 30 students answered "No" at the end of the school year, at least $50-30 = 20$ students who answered "Yes"' at the

beginning of the year gave the same answer at the end, so $x \leq 80$. The difference between the maximum and minimum possible values of x is $80 - 20 = 60$. The minimum $x = 20$ is achieved if exactly 20 students answered "No" at the beginning and "Yes" at the end of the school year. The maximum $x = 80$ is achieved if exactly 20 students answered "Yes at the beginning and the end.

2013A

6. **Answer (B):** If Shenille attempted x three-point shots and $30 - x$ two-point shots, then she scored a total of $\frac{20}{100} \cdot 3 \cdot x + \frac{30}{100} \cdot 2 \cdot (30 - x) = 18$ points.

Remark: The given information does not allow the value of x to be determined.

2009B

7. **Answer (B):** Let p denote the price at the beginning of January. The price at the end of March was $(1.2)(0.8)(1.25)p = 1.2p$. Because the price at the end of April was p, the price decreased by $0.2p$ during April, and the percent decrease was

$$x = 100 \cdot \frac{0.2p}{1.2p} = \frac{100}{6} \approx 16.7\,.$$

To the nearest integer, x is 17.

2004A

9. **(C)** Let r, h, and V, respectively, be the radius, height, and volume of the jar that is currently being used. The new jar will have a radius of $1.25r$ and volume V. Let H be the height of the new jar. Then

$$\pi r^2 h = V = \pi(1.25r)^2 H, \quad \text{so} \quad \frac{H}{h} = \frac{1}{(1.25)^2} = 0.64.$$

Thus H is 64% of h, so the height must be reduced by $(100 - 64)\% = 36\%$.

OR

Multiplying the diameter by $5/4$ multiplies the area of the base by $(5/4)^2 = 25/16$, so in order to keep the same volume, the height must be multiplied by $16/25$. Thus the height must be decreased by $9/25$, or 36%.

2007B

10. **Answer (C):** Let g be the number of girls and b the number of boys initially in the group. Then $g = 0.4(g + b)$. After two girls leave and two boys arrive, the size of the entire group is unchanged, so $g - 2 = 0.3(g + b)$. The solution of the system of equations

$$g = 0.4(g + b) \quad \text{and} \quad g - 2 = 0.3(g + b)$$

is $g = 8$ and $b = 12$, so there were initially 8 girls.

OR

After two girls leave and two boys arrive, the size of the group is unchanged. So the two girls who left represent $40\% - 30\% = 10\%$ of the group. Thus the size of the group is 20, and the original number of girls was 40% of 20, or 8.

2017B

10. **Answer (D):** The students who like dancing but say they dislike it constitute $60\% \cdot (100\% - 80\%) = 12\%$ of the students. Similarly, the students who dislike dancing and say they dislike it constitute $(100\% - 60\%) \cdot 90\% = 36\%$ of the students. Therefore the requested fraction is $\frac{12}{12+36} = \frac{1}{4} = 25\%$.