PROFICIENCY CHALLENGE 5 ANSWER KEY

AMV = “Answers May Vary”

1	a	AMV; For example: Sarah could have found the mean of 97 and 85 to get 91.
	b	AMV; For example: Sarah did not account for the different sizes of the two classes. More students scored an average of 85% than 97%, so the average of the two classes will be closer to 85% than 97%. One possible way to find the average of the two classes would be to consider that everyone earned the average score. That would be 40 students with a score of 85, and 20 students with a score of 97.This would generate an average score of $\frac{85 \bullet 40 + 97 \bullet 20}{40 + 20} = 89$.

2	a	AMV; For example: By arranging the medians, the teams from weakest to strongest are Roger’s, King and William’s. However, considering the range, King appears to be a weaker team, then Roger’s, and then William’s.
	b	AMV; For example: Only consider the top half of each data set would make King appear to be much stronger and William’s seem like a weaker team.
	c	AMV; For example: It is likely that the teams would be ranked as William’s, King, and Roger’s when only considering the top 25% of scores.
	d	AMV; For example: Williams MS appears to have the least MAD; King MS appears to have the greatest MAD. The MAD statistic tells us it is easier to predict what William’s Middle School’s scores will be. King Middle School’s scores are more likely to be farther away from the median compared to William’s MS. You can trust that William’s will perform close to a score of 62; King MS has a similar median (60) but could score as high as 80 and as low as 24.

PROFICIENCY CHALLENGE 6 ANSWER KEY

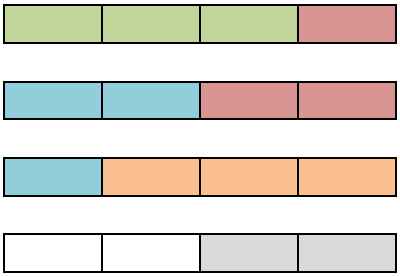
1	a	Isaac won the competition. Suppose that small watermelons weight 1 pound, then medium watermelons weigh 2 pounds, and large watermelons weight 4 pounds. Using these weights: Minh ate $2\frac{1}{4} \bullet 1 = 2\frac{1}{4}$ pounds of watermelon. Jon ate $1\frac{1}{3} \bullet 2 = 2\frac{2}{3}$ pounds of watermelon. Isaac ate $\frac{3}{4} \bullet 4 = 3$ pounds of watermelon. Note this problem can also be solved in terms of small watermelons, in which case Minh ate $2\frac{1}{4}$ small watermelons, Jon ate $2\frac{2}{3}$ small watermelons, and Isaac ate 3 small watermelons.
	b	Minh came in last place.
	c	\$47.50 With a small watermelon weighing 24 ounces, each will earn $\$0.25 \cancel{g} 24 = \$6$. The total number of (small) watermelons consumed is $2\frac{1}{4} + 2\frac{2}{3} + 3 = 7\frac{11}{12}$. This means the total amount of money earned is $\$6 \bullet 7\frac{11}{12} = \$42 + \$5.50 = \$47.50$.

2	a	The Walton family needs to order 2 veggie and 2 pepperoni pizzas. Looking at everyone who wants veggie pizza shows they need $\frac{1}{3} + \frac{1}{3} + \frac{1}{6} + \frac{1}{2} = 1\frac{1}{3}$ veggie pizzas. Looking at everyone who wants pepperoni pizza shows they need $\frac{1}{6} + \frac{3}{4} + \frac{1}{6} = \frac{2}{12} + \frac{9}{12} + \frac{2}{12} = 1\frac{1}{12}$ pepperoni pizzas.
	b	The next day there will be $\frac{2}{3}$ of a veggie pizza and $\frac{11}{12}$ of a pepperoni pizza left over.

PROFICIENCY CHALLENGE 7 ANSWER KEY

AMV = “Answers May Vary”

1	a	$2\frac{1}{2} \bullet 1\frac{3}{4} = 4\frac{3}{8}$ sq. feet.
	c	AMV; For example: 1368 paintings will fit in their entirety. $133 \div 1\frac{3}{4} = 76$ and $46 \div 2\frac{1}{2} = 18\frac{2}{5}$. This means if you lined up the paintings end to end, you can fit 76 along one dimension and 18 along the other dimension. That would be $76 \cdot 18 = 1368$ paintings in total.
	d	AMV; For example: This time we can fit $1398\frac{2}{5}$ paintings. Using the information from part c, we now have $76 \bullet 18\frac{2}{5} = 1398\frac{2}{5}$
	e	AMV; For example: You might choose to do the division in parts c and d, but use only the whole number quotient in part c, but use the entire quotient with remainder for part d.

2	a	AMV; For example: $3\frac{1}{2} \times \frac{3}{4} = 2\frac{5}{8}$ batches of cookies, but that is less than 3 batches, which would require $2\frac{1}{4}$ cups of sugar (and she would still have sugar left over).
	b	AMV regarding diagrams; For example:  Using the diagram to the left, we can see there are 4 sets of $\frac{3}{4}$ cups of sugar (namely, the green, red, blue and orange sets), with an additional $\frac{1}{2}$ cup of sugar, or $\frac{2}{3}$ of a set of $\frac{3}{4}$ cups of sugar. So Takara can make $4\frac{2}{3}$ batches of cookies.
	c	$3\frac{1}{2} \div \frac{3}{4} = \frac{7}{2} \div \frac{3}{4} = \frac{14}{4} \div \frac{3}{4} = \frac{14}{3} = 4\frac{2}{3}$

3	a	Baker Bob will have 24 pieces. Representations may vary, but may include: $6 \div \frac{1}{4} = 24$ 4 pieces per loaf, with 6 loaves is 24 pieces.
	b	$\frac{2}{3} \bullet 24 = 16$ pieces to sell
	d	He gives away 6 pieces. He has 8 pieces left, and $\frac{3}{4} \bullet 8 = 6$ pieces.

PROFICIENCY CHALLENGE 8 ANSWER KEY

AMV = “Answers May Vary”

1		4 limes and 1 lemon is the only possible way for her to spend exactly $1.40.

2	a	AMV; For example: Lee could conisder buying “the maximum” number of pies, with 40 guests and each pie only serving 4 people. That would be 10 pies if each person has 1 slice. He might select to get 15 pies so that half his guests could have 2 slices of pie.
	b	AMV; For example: If Lee bought 10 pies, his cost would be $87.50. 15 pies would cost $131.25.
	c	AMV; For example: If Lee bought 10 pies, he would have $35.50 left over, while he could not afford to buy 15 pies.

3		AMV; For example: Mark can technically fit all his boxes in one large storage unit, but they would fill every available inch of space, which may not be realistic, since he would have to unpack every box if he needed to access them, and there is a door that may take up space. We might recommend that Mark get one Extra Large Storage Unit, or two units of different sizes.

4	a	$1.86 She spent $5 \cdot \$1.15 = \$6.75$ on large beads, and $7 \cdot \$0.85 = \$5.95$ on medium beads. That's a total of $12.70 on beads. Since she began with $14.56, she has $\$14.56 - \$12.70 = \$1.86$ left to spend on small beads.
	b	2 bags of small beads $1 \bullet \$0.70 = \$0.70$, and she has more money to spend. $2 \bullet \$0.70 = \$1.40$, and she has more money to spend. $3 \bullet \$0.70 = \$2.10$, but that is more money than she has left.
	c	Sarah will have $0.46 left after buying all her beads. $1.86 - $1.40 = $0.46