Answers

Applications · **Connections** · **Extensions**

Investigation 4

ACE Assignment Choices

Differentiated Instruction — Solutions for All Learners

Problem 4.1
Core 1–3, 13
Other *Connections* 14; *Extensions* 27–29

Problem 4.2
Core 4–6, 31, 32
Other *Applications* 7; *Connections* 15–19; *Extensions* 29, 33; unassigned choices from previous problems

Problem 4.3
Core 8–12, 20–22, 35–39
Other *Connections* 23–26; *Extensions* 30, 34, 40; unassigned choices from previous problems

Adapted For suggestions about adapting Exercise 6 and other ACE exercises, see the CMP *Special Needs Handbook*.
**Connecting to Prior Units** 13–14, 17–26: *Bits and Pieces I*

Applications

1. Answers will vary.

2. $1.06; 0.99(1.07) = 1.0593$.

3. 20%; the cost for 3 balls is 50 cents, so at the same rate, 6 balls should cost $1. Since the cost for 6 balls is 80 cents (which is 20 cents less than the $1) and 20 cents is 20% of $1, Jason is saving 20%.

4. **a.** 200 students speak Spanish.
   b. 60 students have forgotten their locker combinations.
   c. 200 sixth graders; since 12% is 24 students, 1% would be 2 students. To find 100%, multiply the number of students for 1%, 2, by 100 to get 200 students.

5. **a.** $0.69 is added for tax.
   b. The two should leave approximately $2.17.
   c. Arif should pay $9.81, and Keisha should pay $6.80. This totals $16.61, which is also the sum of the food, tax, and tip. Note: A common student error is to find half of the bill and add $3.00 for Arif's share. Doing so will result in Arif paying $6.00 more than Keisha. Instead, Arif should pay $1.50 more than half the total.

6. **a.** $29.68
   b. $5.60
   c. One strategy is to find 10% ($2.80), then double this amount. Another strategy is to divide the whole bill (100%) by 5 to get 20% of the bill.

7. **a.** This pattern reflects the meaning of 15% tax. 15 cents is added for every dollar since 15 cents is 15% of a dollar.
   b. There would be a 20 cent increase in the tip column for each dollar in the bill column.
   c. One strategy is to multiply the tip for $100 by 3.25. Another strategy is to multiply the tip for $100 by 3, then to add the tip for $25.

8. **a.** Her total before the discount would be $89. She saved 25% of this, or $22.25.
   b. 75%
   c. $69.42

9. $19.96

10. $10.00

11. 25%. $9.00 has been taken off the price. 9 is one-fourth of 36, because the hat is 25% off.

12. **a.** $\frac{35}{100}$ or $\frac{7}{20}$
   b. $81.25
   c. $85.31

Connections

13. He has done 30%. He still needs to do 70%.

14. D

15. The answer will be less than 12. In the second problem, you are dividing by a larger number, thus it will have a smaller quotient.

16. The answer will be greater. One way to see this is to realize that dividing by 0.8 ($\frac{8}{10}$) is the same as multiplying by $\frac{10}{8}$. Now you are multiplying by a larger number than in the first problem, resulting in a larger product.

17. 0.15   **18.** H

19. This will not be possible because the percents add to more than 100%. This is more than the amount of pizza they have.

20. 16 prizes

21. $\frac{6}{9}$ **22.** $\frac{3}{9} = \frac{6}{18}$

23. Possible answers: $\frac{8}{18}, \frac{12}{27}$

24. Possible answers: $\frac{6}{10}, \frac{9}{15}$

25. Possible answers:
$\frac{1}{3} = \frac{8}{24}, \frac{2}{3} = \frac{8}{12}, \frac{4}{3} = \frac{8}{6}, \frac{8}{3} = \frac{8}{3}, \frac{24}{3} = \frac{8}{1}$

26. Possible answers: $\frac{5}{9} = \frac{10}{18}, \frac{5}{3} = \frac{30}{18}$

Extensions

27. Answers will vary.

28. $5.31

29. a. Local tax is $0.80. State tax is $1.60.

    b. $34.40

30. New inflation rate will be 4.4%. 4% inflation means something that costs a dollar now will cost 4 cents more one year from now. If inflation increases 10%, this means that this increase will be 10% larger or 4.4 cents per dollar. A common mistake is to add 4% and 10% and say 14% as the answer. However, if we wish to say that inflation increased to 14% from 4%, we need to say that it increased 10 *percent points*, or that inflation increased 250%.

This makes sense if you think about what it would mean for inflation to double from 4%. This would mean a 100% increase in inflation to 8%.

31.

32.

33.
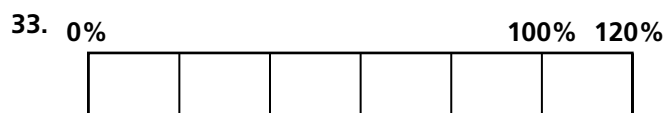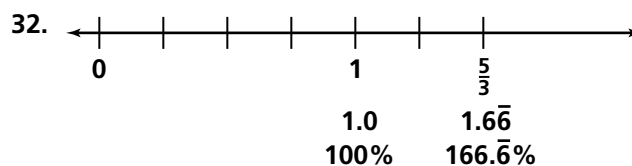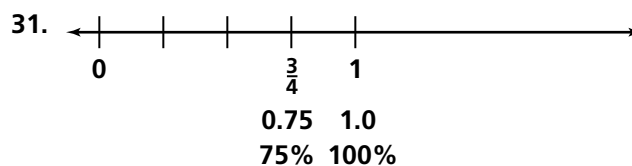
34. a. $14.85 (Note: Some students may want to take 35% of $22. This is incorrect. It requires two procedures: 10% off $22 and then 25% off $19.80.)

    b. $131.25

35. $\frac{1}{3} = \frac{3}{9} = \frac{2}{6}$

36. $\frac{12}{18} = \frac{8}{12} = \frac{4}{6}$

37. One possible answer: $\frac{3}{2} = \frac{12}{8} = \frac{9}{6}$

38. One possible answer: $\frac{1}{3} = \frac{7}{21} = \frac{2}{6}$

39. Exercises 37 and 38 have more than one possible answer since none of the fraction values are fixed. So, we determine that value of the fraction by our choice of numbers.

40. 3.75, or $3\frac{3}{4}$, cups

Possible Answers to Mathematical Reflections

1. To find the tax on a purchase, change the tax percent to a decimal. Multiply this decimal by the purchase price. Then the final bill will be the purchase price plus this tax. To save time, you can add 100% to the tax percent, then multiply this decimal by the purchase price to get the final bill in one step.

Example: How much will tax and total bill be for an item with a $35.00 purchase price at 6% tax? 6% becomes 0.06 as a decimal. $35 \times 0.06 = 2.10$. The tax will be $2.10 and the final bill will be $37.10. In one step, this would be $35 \times 1.06 = 37.10$.

2. This is just like figuring tax, except we need to subtract the discount from the purchase price, instead of adding it. So change the percent discount to a decimal. Multiply the decimal by the purchase price. This answer is the discount. Subtract the discount from the purchase price. The one-step shortcut is to subtract the percent discount from 100%, then change this new percent to a decimal and multiply by the purchase price.

3. a. Take the 5% amount and multiply by 3 to get 15%. Then double the 1% amount to get 2%. Add these two results.

b. 10% is easy to get by doubling 5%. We can get any other whole percent by using multiples of 10%, 5%, and 1%.

4. Divide the amount of the tax by the percent tax to get 1% of the purchase price. Then multiply this answer by 100. In an example, if 6.5% tax came to $1.30, we would divide $1.30 by 6.5 to get 0.2. Then $0.20 is 1% of the cost of the item, so $20.00 is 100% of the cost.

5. We can think of 7 out of 35 as $\frac{7}{35}$, which is also $\frac{1}{5}$. As a decimal, it is 0.2, or 20%. In general, represent the numbers as a fraction, convert the fraction to a decimal, then to a percent.