Investigation 1

ACE Assignment Choices

Differentiated Instruction — Solutions for All Learners

Problem 1.1

Core 6–8, 48
Other *Applications* 1–5, *Connections* 39

Problem 1.2

Core 9–19
Other *Connections* 40, 41, 44–47; *Extensions* 49–51; unassigned choices from previous problems

Problem 1.3

Core 20–29
Other *Applications* 30, 31; *Connections* 42, 43; unassigned choices from previous problems

Problem 1.4

Core 36, 37
Other *Applications* 10; *Connections* 32–35, 38; *Extensions* 52–54; unassigned choices from previous problems

Adapted For suggestions about adapting Exercise 4 and other ACE exercises, see the CMP *Special Needs Handbook*.
Connecting to Prior Units 44–47: *Bits and Pieces I* and *Comparing and Scaling*

Applications

1–4. Answers will vary. Possible answers given.

1. The Super Brains answered a 250-point question correctly, a 50-point question incorrectly, a 100-point question correctly, a 200-point question incorrectly, and a 200-point question correctly.

$250 + {}^{-}50 + 100 + {}^{-}200 + 200 = 300$

2. The Rocket Scientists answered a 50-point question correctly, a 150-point question correctly, a 100-point question incorrectly, a 150-point question incorrectly, and a 150-point question incorrectly.

$50 + 150 + {}^{-}100 + {}^{-}150 + {}^{-}150 = {}^{-}200$

3. The Know-It-Alls answered a 50-point question correctly, a 100-point question incorrectly, a 150-point question incorrectly, a 100-point question incorrectly, and a 50-point question correctly.

$50 + {}^{-}100 + {}^{-}150 + {}^{-}100 + 50 = {}^{-}250$

4. The Teacher's Pets answered a 100-point question correctly, a 200-point question correctly, a 150-point question incorrectly, a 200-point question incorrectly, and a 50-point question correctly.

$100 + 200 + {}^{-}150 + {}^{-}200 + 50 = 0$

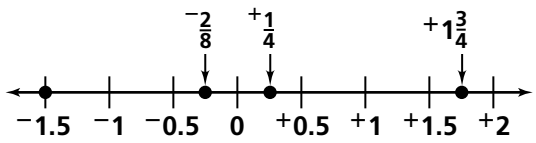
5. B

6. $250 + 100 + 200 + {}^{-}150 + {}^{-}200 = 200$ or $250 + 100 + 200 - 150 - 200 = 200$

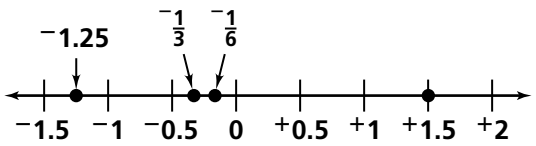
7. ${}^{-}200 + 50 + 250 + {}^{-}150 + {}^{-}50 = {}^{-}100$ or ${}^{-}200 + 50 + 250 - 150 - 50 = {}^{-}100$

8. ${}^{-}50 + {}^{-}200 + 100 + 200 + {}^{-}150 = {}^{-}100$ or ${}^{-}50 - 200 + 100 + 200 - 150 = {}^{-}100$

9.



10.



11. ${}^{-}45.2,\ {}^{-}\frac{4}{5},\ {}^{-}0.5,\ 0.3,\ \frac{3}{5},\ 23.6,\ 50$

12. $3 > 0$

13. ${}^{-}23.4 < 25.2$

14. $46 > {}^{-}79$

15. ${}^{-}75 > {}^{-}90$

16. ${}^{-}300 < 100$

17. ${}^{-}1{,}000 < {}^{-}999$

18. ${}^{-}1.73 = {}^{-}1.730$

19. ${}^{-}4.3 < {}^{-}4.03$

20. 1

21. 2

22. ${}^{-}8$

23. 0

24. 10

25. ${}^{-}2$

26. ${}^{-}4$

27. ${}^{-}3$

28. ${}^{-}5$

29. ${}^{-}11$

30. a. It fell by 100° ($^-100°$).
$^-56° - 44° = {}^-100°$

b. $^-56° - 44° = {}^-100°$ or
$44° + {}^-100° = {}^-56°$

c. (Figure 7)

31. a. The change from A to B is 15 units.
$^-25 + \square = {}^-10$ or $^-10 - {}^-25 = \square$;
$\square = 15$

b. The change from A to C is 45 units.
$^-25 + \square = {}^+20$ or $^+20 - {}^-25 = \square$;
$\square = {}^+45$

c. The change from B to C is 30 units.
$^-10 + \square = {}^+20$ or $^+20 - {}^-10 = \square$;
$\square = {}^+30$

d. The change from C to A is $^-45$ units.
$^+20 + \square = {}^-25$ or $^-25 - {}^+20 = \square$;
$\square = {}^-45$

e. The change from B to A is $^-15$ units.
$^-10 + \square = {}^-25$ or $^-25 - {}^-10 = \square$;
$\square = {}^-15$

32. End with: 2 red chips

33. End with: 2 red chips

34. Add: 3 black chips or Subtract: 3 red chips.

35. Start with: any combination equivalent to 1 red chip

36. Answers will vary. Possible answer: Julia earned \$5 mowing her neighbor's yard, but she spent \$8 on gas; $^-8 + {}^+5 = {}^-3$

37. Answers will vary; however, it is important for students to recognize that it is the opposite pairs ($^+1 + {}^-1$) that are used to change the number of chips but keep the total value the same. For example, one can add 2 pairs of black and red chips and still leave the value of the board unchanged ($^+7 + {}^-10 = {}^-3$). One can also remove 4 pairs of black and red chips and still leave the value of the board unchanged ($^+1 + {}^-4 = {}^-3$).

38. a. 0; 8 original red chips − 3 red chips = 5 red chips remaining; $^+5 + {}^-5 = 0$

b. $^+3$; 5 original black chips + 3 black chips = 8 black chips; $^+8 + {}^-5 = {}^+3$

c. $^+8$; 8 black chips + 200 black chips = 208 black chips; 5 red chips + 195 red chips = 200 red chips; $^+208 + {}^-200 = {}^+8$

Connections

39. a. gain of 8 yds;
$^+7 + {}^+2 + {}^-5 + {}^-12 + {}^+16 + {}^+8 + {}^-8 = {}^+8$

b. about 1.14 yd per play; $8 \div 7 \approx 1.14$

40. 4 below par; $^+4 + {}^-6 + {}^-3 + {}^+1 = {}^-4$

41. 3 below par; $^-2 + {}^-1 + {}^+5 + {}^-5 = {}^-3$

42. F

43. D

44. $\frac{3}{10}, \frac{9}{25}, \frac{2}{5}, \frac{5}{9}$

45. 2.505, 20.33, 23, 23.30

46. $\frac{9}{6}$, 1.52, $1\frac{4}{7}$, 2

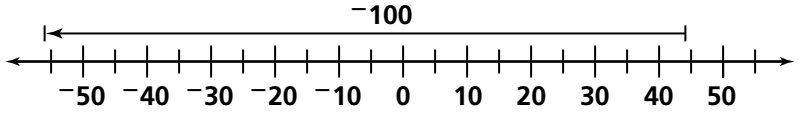
47. $2\frac{8}{9}$, 2.95, 3, $\frac{19}{6}$

Extensions

48. a.

Date	Transaction	Balance
December 1		\$595.50
December 5	Writes a check for \$19.95	\$575.55
December 12	Writes a check for \$280.88	\$294.67
December 15	Deposits \$257.00	\$551.67
December 17	Writes a check for \$58.12	\$493.55
December 21	Withdraws \$50.00	\$443.55
December 24	Writes checks for \$17.50, \$41.37, and \$65.15	\$319.53
December 26	Deposits \$100.00	\$419.53
December 31	Withdraws \$50.00	\$369.53

Figure 7



b. $369.53

c. December 1, 2, 3, and 4 ($595.50); however, if the starting balance is excluded, then Kenji had the greatest balance during the month on December 5–11, with $575.55.

d. December 12, 13, and 14 with $294.67

49. 2.5°C; $(20 + {}^{-}15) \div 2 = 5 \div 2 = 2.5$

50. High was 18°C; $5 = (X + {}^{-}8) \div 2$; $10 = X + {}^{-}8$; $18 = X$

51. ${}^{-}12.5$°C; $({}^{-}10 + {}^{-}15) \div 2 = {}^{-}12.5$

52–54. Answers will vary.

52. $A = 5, B = 6, 5 + {}^{-}6 = {}^{-}1$

53. $A = 2, B = 2, {}^{-}2 + 2 = 0$

54. $A = 7, B = 5, {}^{-}7 - {}^{-}5 = {}^{-}2$

Possible Answers to Mathematical Reflections

1. a. The number with the greater value (further to the right on the number line) is greater.

b. The greater the value of the number when its sign is ignored, the less the number (the further to the left on the number line).

c. A positive number is always greater than a negative number. The positive number is greater than or to the right of zero, and the negative number is less than or to the left of zero.

2. When comparing two numbers, the number further to the right on a horizontal number line, or further up on a vertical number line, is greater.