

# Student Journal Answers

## Chapter 1

### Review & Refresh

- $7 + y$ ;  
 $2 + (5 + y) = (2 + 5) + y$  Assoc. Prop. of Add.  
 $= 7 + y$  Add 2 and 5.
- $c + 10$ ;  
 $(c + 1) + 9 = c + (1 + 9)$  Assoc. Prop. of Add.  
 $= c + 10$  Add 1 and 9.
- $n + 3.7$ ;  
 $(2.3 + n) + 1.4 = (n + 2.3) + 1.4$  Comm. Prop. of Add.  
 $= n + (2.3 + 1.4)$  Assoc. Prop. of Add.  
 $= n + 3.7$  Add 2.3 and 1.4.
- $12 + d$ ;  
 $7 + (d + 5) = 7 + (5 + d)$  Comm. Prop. of Add.  
 $= (7 + 5) + d$  Assoc. Prop. of Add.  
 $= 12 + d$  Add 7 and 5.
- $t + 3$ ;  
 $(t + 3) + 0 = t + (3 + 0)$  Assoc. Prop. of Add.  
 $= t + 3$  Add. Prop. of Zero
- $4 + g$ ;  
 $0 + (g + 4) = 0 + (4 + g)$  Comm. Prop. of Add.  
 $= (0 + 4) + g$  Assoc. Prop. of Add.  
 $= 4 + g$  Add. Prop. of Zero
- $\frac{17}{72}$
- $\frac{47}{30}$
- $\frac{1}{3}$
- $\frac{2}{35}$
- $7\frac{1}{12}$  cups

### 1.1 Exploration

#### Exploration 1

- Sample answer:* 3 units; the absolute value
- Answers will vary. The number to the right on the number line is greater.
- Answers will vary.

#### 1.1 Practice

- =
- <
- <
- a. 15, -6      b. 15, |-6|

- $-|-34|, |0|, 14, |-25|, 28$
- $-16, 10, |-16|, |25|, |-43|$
- a. Phosphorus; 280 is the largest positive number, thus it is the highest boiling point.  
 b. Oxygen;  $|-183| < 184$ ;  $183 < 184$
- a. up      b. 13 ft/sec  
 c. down      d. 17 ft/sec
- 0
- true; Both numbers have an absolute value of 3.
- false; *Sample number:* Let  $x = -4$ . Then  $|x| = 4$  and 4 is not less than  $-4$ .

### 1.2 Exploration

#### Exploration 1

- Sample answer:* Use integer counters to represent each number; Use the same number of positive and negative counters.
- $-3 + 2$ ;  $-1$
- 

Expression	Type of Sum	Sum	Sum: Positive, Negative, or Zero
$-3 + 2$	Integers with different signs	-1	Negative
$-4 + (-3)$	Integers with the same sign	-7	Negative
$5 + (-3)$	Integers with different signs	2	Positive
$7 + (-7)$	Integers with different signs	0	Zero
$2 + 4$	Integers with the same sign	6	Positive
$-6 + (-2)$	Integers with the same sign	-8	Negative
$-5 + 9$	Integers with different signs	4	Positive
$15 + (-9)$	Integers with different signs	6	Positive
$-10 + 10$	Integers with different signs	0	Zero
$-6 + (-6)$	Integers with the same sign	-12	Negative
$13 + (-13)$	Integers with different signs	0	Zero

- d. The sum will have the same sign as the integer with the greater absolute value, unless they are opposites. If they are opposites, the sum is zero.
- e. *Sample answer:* (i) Add the absolute values of the integers and make the sum the same sign as the addends; (ii) Subtract the absolute values and use the sign of the integer with the greater absolute value; (iii) The sum is zero.

### 1.2 Practice

- 5
- Use the Commutative Property to switch the positions of the terms  $-25$  and  $-18$ . Then use the Associative Property to group the terms  $18$  and  $-18$ . Because they are opposites, their sum will be zero;  $-25$
- Use the Commutative Property to switch the positions of the terms  $45$  and  $-8$ . Then use the Associative Property to group the terms  $-22$  and  $-8$ ;  $15$
- Use the Commutative Property to switch the positions of the terms  $-12$  and  $4$ . Then use the Associative Property to group the terms  $28$  and  $4$ ;  $20$
- 18
- 14
- $-59$
- The sum is 5 units to the right of  $p$ .
- The sum is 2 units to the left of  $p$ .
- The sum is  $|q|$  units to the right of  $p$  if  $q < 0$ . The sum is  $q$  units to the left of  $p$  if  $q > 0$ . The sum is at  $p$  if  $q = 0$ .
- $n = 25$
- $c = 71$
- $k = -80$
- Sample answer:*  $-30, 8, 2$ ;  
*Sample answer:*  $8, 7, -5$
- $-10^\circ\text{F}$

16. *Sample answer:*

9	-6	3
-1	0	1
-8	6	2

- $p = 0, q = 0$ ; Both absolute values will be positive or zero. The sum of two absolute values is zero when both numbers equal zero.
  - no possible values; To get a negative sum, at least one term must be negative and the absolute value of a number cannot be negative.

- all values except when both  $p$  and  $q$  equal zero. The sum of two positive numbers is greater than zero. The sum of a positive number and zero is greater than zero.

### 1.3 Exploration

#### Exploration 1

a. *Sample answer:*

$$\frac{1}{7}; \frac{1}{7} + \frac{3}{7}; -\frac{2}{7} + \left(-\frac{3}{7}\right); -\frac{4}{7} + \frac{5}{7}; \frac{4}{7} + \left(-\frac{5}{7}\right);$$

$$\frac{4}{7}; -\frac{5}{7}; \frac{1}{7}; -\frac{1}{7}$$

- yes; *Sample answer:* Use absolute values and a number line to add any numbers.
- yes; *Sample answer:* Rational numbers are added the same way integers are added, so the properties would still apply.

### 1.3 Practice

- $$2\frac{5}{6} + \left(-\frac{8}{15}\right) = \frac{17}{6} + \left(-\frac{8}{15}\right)$$

$$= \frac{85 + (-16)}{30}$$

$$= \frac{69}{30} = 2\frac{9}{30} = 2\frac{3}{10}$$
- $-\frac{19}{20}$
- $-\frac{1}{20}$
- $\frac{11}{20}$
- $\$8.44$
- $\frac{8}{21}$
- $-5\frac{11}{20}$
- $-3\frac{7}{9}$
- 20
- when the absolute value of the positive number is greater than the absolute value of the negative number
- greater than; The sum of the 3 months of difference is positive.
- $-\$2.35$
- when the decimal portions have a sum of 1

### 1.4 Exploration

#### Exploration 1

- 2; 2; The answers are the same.
- Place 3 negative counters in the box and then place a zero pair in the box. Remove the positive counter of the zero pair and the result is the sum.

Exercise	Operation: Add or Subtract	Answer
$4 - 2$	Subtract 2.	2
$4 + (-2)$	Add $-2$ .	2
$-3 - 1$	Subtract 1.	$-4$
$-3 + (-1)$	Add $-1$ .	$-4$
$3 - 8$	Subtract 8.	$-5$
$3 + (-8)$	Add $-8$ .	$-5$
$9 - 13$	Subtract 13.	$-4$
$9 + (-13)$	Add $-13$ .	$-4$
$-6 - (-3)$	Subtract $-3$ .	$-3$
$-6 + 3$	Add 3.	$-3$
$-5 - (-12)$	Subtract $-12$ .	7
$-5 + 12$	Add 12.	7

- d. *Sample answer:* When subtracting two integers, add the opposite of the subtracted integer.

#### 1.4 Practice

- 36 ft;  $8 - (-28)$
- 13
- $-44$
- 206
- Sample answer:* Write the subtraction as addition. Use the Commutative Property to switch the last two terms. Then use the Associative Property to add  $-(-22)$  and  $-22$  first; 17
- Sample answer:* Use the Commutative Property to switch the first two terms. Then use the Associative Property to add  $-15$  and  $15$  first;  $-31$
- Sample answer:* Write the subtraction as addition. Use the Associative Property to add 19 and  $(-19)$  first;  $-24$
- a.  $94^\circ\text{F}$ ,  $103^\circ\text{F}$ ,  $114^\circ\text{F}$ ,  $107^\circ\text{F}$ ,  $84^\circ\text{F}$ ,  $76^\circ\text{F}$ ,  $64^\circ\text{F}$ ,  $65^\circ\text{F}$ ,  $75^\circ\text{F}$ ,  $86^\circ\text{F}$ ,  $105^\circ\text{F}$ ,  $98^\circ\text{F}$   
b.  $99^\circ\text{F}$ ,  $-46^\circ\text{F}$   
c. 145
- 23
- 7
- $-53$
- when  $|b| > |a|$  or  $a$  and  $b$  have different signs
- Sample answer:*  $-6$ ,  $-12$ ;  $-1$ ,  $-7$
- The difference is 3 units to the left of  $p$ .
- The difference is 5 units to the right of  $p$ .

16. The difference is  $q$  units to the right of  $p$  if  $q < 0$ . The difference is  $q$  units to the left of  $p$  if  $q > 0$ . The sum is at  $p$  if  $q = 0$ .

17. a. *Sample answer:* 10, 12,  $-2$ ; 5, 6,  $-1$

- b. *Sample answer:* 10, 2, 9; 16, 1, 2

#### 1.5 Exploration

##### Exploration 1

- Sample answer:*  $\frac{1}{7}; \frac{2}{7} - \frac{5}{7}; -\frac{4}{7} - \left(-\frac{1}{7}\right); -\frac{3}{7}; -\frac{3}{7}$
- yes; *Sample answer:* Use absolute values and a number line to subtract any numbers.
- Sample answer:* yes; Rewrite the subtraction as addition first, then apply the properties.

##### Exploration 2

- 5
- Find the value of  $|3 - (-2)|$ ;  $|3 - (-2)| = 5$
- Sample answer:*  $\left|-\frac{1}{5} - \frac{3}{5}\right| = \left|-\frac{1}{5} + \left(-\frac{3}{5}\right)\right| = \left|-\frac{4}{5}\right| = \frac{4}{5}$

#### 1.5 Practice

- $2\frac{8}{15}$
- 13.7
- 1.7
- $7\frac{13}{16} - 9\frac{5}{8} = -1\frac{13}{16}$
- $-5\frac{5}{6}$
- $-24.625$
- 3.975
- $-1\frac{2}{9}$
- $-\$90.73$
- $1\frac{6}{8}$
- when the fractional parts are equal
- a. 0; The points lie on a vertical line.  
b.  $\frac{1}{2}$   
c.  $\frac{2}{3} - 1\frac{1}{6}$   
d.  $1\frac{1}{6} - \frac{2}{3}$   
e. part (c)

## Chapter 2

### Review & Refresh

- $70t$   
 $10(7t) = (10 \cdot 7)t$  Assoc. Prop. of Mult.  
 $= 70t$  Multiply 10 and 7.
- $32k$   
 $8(4k) = (8 \cdot 4)k$  Assoc. Prop. of Mult.  
 $= 32k$  Multiply 8 and 4.