CLASSICAL PREP 7th GRADE: MATH

Add your family to our Rising 7th Grade Google Classroom!

- Log into your student's CPS Google account
- Go to classroom.google.com
- Add yourself to the Summer Google Classroom by using the following class code: **3q34c4m5**
- Videos and IXL codes will be in the Classwork section, separated by topic

MATH FACT PRACTICE DIRECTIONS

EVERY rising 7th grade scholar is expected to have mastered multiplication & division facts up to 12. Mastery means that those facts are memorized and quickly accessible so that the scholar can turn attention to grasping more complex concepts.. For those scholars who have not yet mastered ALL of these facts, we recommend the following:

- Math fact practice should take no more than 10 minutes a day.
- **REMEMBER**: Consistency is key!
- Make or purchase a set of multiplication AND division flashcards.
- Practice the flashcards for five to ten minutes per day.
- Don't be afraid to look for other options, like learning games and apps, to help your child practice these facts.

MATH WORKSHEET PACKET DIRECTIONS

- Work through the provided math packet, which has been created based on 6th Grade 2025 FAST math scores.
- It is likely that some of these topics will be a stretch for many scholars. Please exhibit fortitude, working consistently and seeking out resources for help.
- Aim for a few pages per week, focusing on understanding and mastery rather than speed.
- **IF YOU GET STUCK OR DON'T KNOW WHERE TO START:**
  - Watch the videos posted on our Google Classroom.
  - Practice an IXL code (listed on the Google Classroom).
  - Move on to something else and come back to that page

A NOTE ABOUT IXL OVER THE SUMMER

IXL is an **invaluable** resource for bridging gaps, especially in math. Please feel free to use it to practice concepts that are not yet mastered. The IXL diagnostic can help you pinpoint areas for growth, and recommended skills are a great place to start for additional practice. While we are not requiring specific codes over the summer, we are expecting that scholars return to school feeling comfortable and confident with the materials in their math packet. If they're not, IXL should be a part of your summer learning plan.

IXL practice will be a requirement for every rising 6th grade math student next year, so getting comfortable and familiar with the platform is a good option over the summer!

CLASSICAL PREP 7th GRADE: MATH

MATH PACKET PAGES CHECKLIST

EXPECTATIONS:

- All work will be shown to justify answer.
- All work will be neatly written either in the space on the worksheet or, if there is not enough space, on lined paper.
- Work will be organized, clear, and complete.

- ❏ Comparing and Ordering Rational Numbers
- ❏ Exponents with Whole Number, Decimal, and Fractional Bases
- ❏ Greatest Common Factor (Reteach)
- ❏ Greatest Common Factor (Practice and Problem Solving)
- ❏ Factoring with the Distributive Property
- ❏ Least Common Multiple (Reteach)
- ❏ Least Common Multiple (Practice and Problem Solving)
- ❏ Dividing Fractions: Practice and Problem Solving
- ❏ Solving Equations (2 pages)
- ❏ Representation of Integers
- ❏ Exploring Integers (Reteaching 11-1)
- ❏ Fill in the Missing Elements: Table (Integers)
- ❏ Comparing and Ordering Integers (Reteaching 11-2)
- ❏ Integer Operations (Resource Page)
- ❏ Adding Integers (Reteaching 11-3: odds only)
- ❏ Adding Integers Practice 11-3
- ❏ Subtracting Integers (Reteaching 11-4: odds only)
- ❏ Subtracting Integers Practice 11-4
- ❏ Addition & Subtraction of Integers (Odds Only)
- ❏ Multiplying Integers (Reteaching 11-5)
- ❏ Multiplying Integers Practice 11-5
- ❏ Dividing Integers (Reteaching 11-6)
- ❏ Dividing Integers Practice 11-6
- ❏ Statistics & Statistical Questions: Lesson 9.1 (Read & Try Problems)
- ❏ Finding Statistical Questions
- ❏ Using a Dot Plot
- ❏ Box Plots (Reteach)
- ❏ Box Plots (Practice & Problem Solving)
- ❏ Mean, Median, Mode, and Range (Reteach)
- ❏ Mean, Median, and Mode Worksheet

Grade 7 FAST Mathematics Reference Sheet

Conversions within a System of Measure

Customary Conversions

1 foot = 12 inches
1 yard = 3 feet
1 mile = 5,280 feet
1 mile = 1,760 yards

1 cup = 8 fluid ounces
1 pint = 2 cups
1 quart = 2 pints
1 gallon = 4 quarts

1 pound = 16 ounces
1 ton = 2,000 pounds

Metric Conversions

1 meter = 100 centimeters
1 meter = 1000 millimeters
1 kilometer = 1000 meters

1 liter = 1000 milliliters

1 gram = 1000 milligrams
1 kilogram = 1000 grams

Time Conversions

1 minute = 60 seconds
1 hour = 60 minutes
1 day = 24 hours
1 week = 7 days
1 year = 365 days
1 year = 52 weeks

Conversions between Systems of Measure

Customary to Metric Conversion Approximations

1 inch = 2.54 centimeters
1 foot = 0.305 meters
1 mile = 1.61 kilometers

1 cup = 0.24 liters
1 gallon = 3.785 liters
1 ounce = 28.35 grams
1 pound = 0.454 kilograms

Metric to Customary Conversion Approximations

1 centimeter = 0.39 inches
1 meter = 3.28 feet
1 kilometer = 0.62 miles

1 liter = 4.23 cups
1 liter = 0.264 gallons
1 gram = 0.0352 ounces
1 kilogram = 2.204 pounds

Grade 7 FAST Mathematics Reference Sheet

Formulas

Parallelogram	$A = bh$
Or Rhombus	$A = lw$
Trapezoid	$A = \frac{1}{2}h(b_1 + b_2)$
Circle	$C = 2\pi r$ or $C = \pi d$ $A = \pi r^2$
Right Circular Cylinder	$V = Bh$ or $V = \pi r^2 h$

Key	
b = base	A = area
h = height	C = circumference
l = length	V = volume
w = width	
r = radius	
d = diameter	
B = area of base	

Simple Interest Formula

$$I = prt$$

where I = interest, p = principal, r = rate, t = time

Percent Error Formula

$$\frac{|Estimate - Actual|}{Actual} \times 100$$

Percent of Change

$$\frac{final\ value - initial\ value}{initial\ value} \times 100$$

Comparing and Ordering Rational Numbers

Fill in each blank with < , > , or = to make each sentence true.

1. $\dfrac{2}{3}$ ___ $\dfrac{5}{8}$

2. -3/4 ___ -.75

3. 1.1 ___ 1.05

4. $\dfrac{2}{5}$ ___ 0.44

Write the numbers in order from least to greatest.

5. $\dfrac{3}{8}$ $\dfrac{1}{4}$ $\dfrac{7}{8}$

6. 0.44, 3/8, 0.5, 2/5

7. 0.2, 4/15, 0.21, 1/4

8. $-2.1,\ 0.5, -0.5,\ \dfrac{5}{100}$

9. $-10,\ 2, -0.5,\ \dfrac{5}{16}$

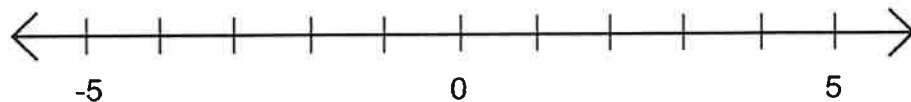10. $4^2, -\dfrac{5}{2}, -2\dfrac{1}{3}, \dfrac{1}{16}$
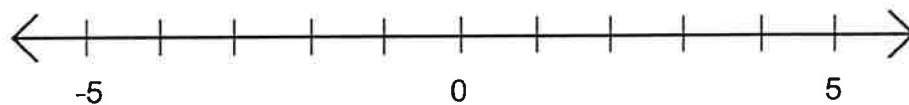
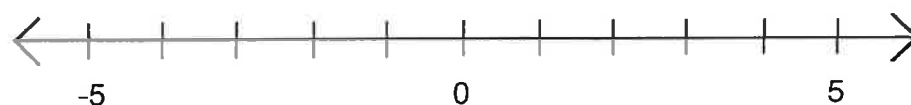Plot the following numbers on the number lines.

11. -5, 2, -5.5, 3, -1/3
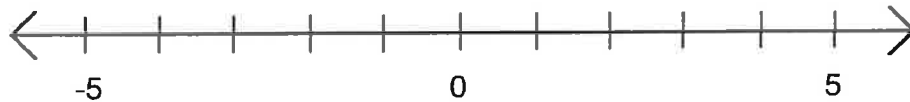
12. $\dfrac{3}{2}, 2^2, 2.2, -2$

13. $-\dfrac{3}{4}, 0, -3, 0.75, -1.8, -3.5$

14. $1\dfrac{3}{7}, 2.5, 3.5, -2.2, -4\dfrac{5}{9}, -\dfrac{30}{6}$

Exponents with whole number, decimal and fractional bases

Grade 6 Exponents Worksheet

Evaluate the following expressions.

1) $\left(\dfrac{1}{2}\right)^5$

2) 2^3

3) 0.5^2

4) $\left(\dfrac{2}{3}\right)^4$

5) 1.2^1

6) 7^2

7) 0.2^3

8) 9^2

9) $\left(\dfrac{5}{2}\right)^3$

10) 0.1^4

11) $\left(\dfrac{1}{4}\right)^2$

12) 1^{13}

Name _____ Date _____ Class _____

Greatest Common Factor
Reteach

The *greatest common factor*, or GCF, is the largest number that is the factor of two or more numbers.

To find the GCF, first write the factors of each number.

Example

Find the GCF of 18 and 24.

Solution Write the factors of 18 and 24. Highlight the *largest* number that is common to both lists of factors.

Factors of 18: 1, 2, 3, **6**, 9, and 18

Factors of 24: 1, 2, 3, 4, **6**, 8, 12, and 24

The GCF of 18 and 24 is 6.

This process works the same way for more than two numbers.

Find the GCF.

1. 32 and 48   2. 18 and 36   3. 28, 56, and 84   4. 30, 45, and 75

_____   _____   _____   _____

The *distributive principle* can be used with the GCF to rewrite a sum of two or more numbers.

Example
Write 30 + 70 as the product of the GCF of 30 and 70 and a sum.

Solution

Step 1 Find the GCF of 30 and 70.

Factors of 30: 1, 2, 3, 5, 6, **10**, 15, and 30

Factors of 70: 1, 2, 5, 7, **10**, 14, 35, and 70. The GCF is 10.

Step 2 Write "10 × (? + ?)." To find the questions marks, divide: 30 ÷ 10 = 3; 70 ÷ 10 = 7

Step 3 So, 30 + 70 can be written as 10 × (3 + 7).

Rewrite each sum as a product of the GCF and a new sum.

5. 9 + 15 =   6. 100 + 350 =   7. 12 + 18 + 21 =

_____   _____   _____

LESSON 2-1

Greatest Common Factor

Practice and Problem Solving: A/B

List the factors of each number.

1. 5

2. 15

3. 60

_____

_____

_____

4. 6

5. 12

6. 36

_____

_____

_____

Find the *greatest common factor* (GCF) for each pair of numbers.

7. 6 and 9

8. 4 and 8

9. 8 and 12

_____

_____

_____

10. 6 and 15

11. 10 and 15

12. 9 and 12

_____

_____

_____

Write the sum of the numbers as the product of their GCF and another sum.

13. $44 + 40 =$

14. $15 + 81 =$

_____

_____

15. $13 + 52 =$

16. $64 + 28 =$

_____

_____

Solve.

17. A jewelry maker will use 24 jade beads and 30 teak beads to make necklaces. Each necklace will have the same numbers of jade beads and teak beads. What is the greatest number of necklaces she can make? How many beads of each type are on each necklace?

_____

18. The marine-life store would like to set up fish tanks that contain equal numbers of angel fish, swordtails, and guppies. What is the greatest number of tanks that can be set up if the store has 12 angel fish, 24 swordtails, and 30 guppies?

_____

★ **Factoring is working BACKWARD to find the original distributive property expression.** ★

Math 6 - Unit 3: Expressions   Name: _____

Factoring with the Distributive Property Practice #1

Find the GCF - Divide by that GCF - Rewrite as distributive property problem.

Class Period: 1 2 3 4 Date: _____

Use the distributive property and the greatest common factor to factor the following problems. Be sure to show all your work.

E
X
A
M
P
L
E
S

1. $\frac{55v + 77}{11}$ GCF: 11

$11(5v + 7)$ (rewrite)

2. $\frac{27y + 90}{9}$ GCF: 9

$9(3y + 10)$ (rewrite)

3. $\frac{63u + 28}{7}$ GCF: 7

$7(9u + 4)$

4. $\frac{50 + 90n}{10}$ GCF: 10

$10(5 + 9n)$

5. $\frac{35 + 55m}{5}$ GCF: 5

$5(7 + 11m)$

6. $\frac{36w + 40}{4}$ GCF: 4

$4(9w + 10)$

7. 32 + 20n

8. 48g + 54

9. 72 + 40u

10. 16y + 16

11. 45 + 54b

12. 44 + 36y

13. 6y + 27

14. 15 + 12c

15. 66u + 21

16. 44 + 36q

17. 77r + 33

18. 99p + 121

19. 54 + 48w

20. 54x + 99

21. 30 + 72b

22. 40 + 55x

23. 45 + 72d

24. 12 + 21p

LESSON 2-2 Least Common Multiple

Reteach

The smallest number that is a multiple of two or more numbers is called the least common multiple (LCM) of those numbers.

To find the least common multiple of 3, 6, and 8, list the multiples for each number and put a circle around the LCM in the three lists.

Multiples of 3: 3, 6, 9, 12, 15, 18, 21, 24

Multiples of 6: 6, 12, 18, 24, 30, 36, 42

Multiples of 8: 8, 16, 24, 32, 40, 48, 56

So 24 is the LCM of 3, 6, and 8.

List the multiples of each number to help you find the least common multiple of each group.

1. 2 and 9

   Multiples of 2:

   _____

   Multiples of 9:

   _____

   LCM: _____

2. 4 and 6

   Multiples of 4:

   _____

   Multiples of 6:

   _____

   LCM: _____

3. 4 and 10

   Multiples of 4:

   _____

   Multiples of 10:

   _____

   LCM: _____

4. 2, 5, and 6

   Multiples of 2:

   _____

   Multiples of 5:

   _____

   Multiples of 6:

   _____

   LCM: _____

5. 3, 4, and 9

   Multiples of 3:

   _____

   Multiples of 4:

   _____

   Multiples of 9:

   _____

   LCM: _____

6. 8, 10, and 12

   Multiples of 8:

   _____

   Multiples of 10:

   _____

   Multiples of 12:

   _____

   LCM: _____

LESSON 2-2

Least Common Multiple

Practice and Problem Solving: A/B

List the first three multiples of each number.

1. 3   2. 7   3. 12   4. 200

_____   _____   _____   _____

Find the *least common multiple* (LCM).

5. 2 and 3   6. 4 and 5   7. 6 and 7

   2: _____   4: _____   6: _____

   3: _____   5: _____   7: _____

8. 2, 3, and 4   9. 5, 6, and 7   10. 8, 9, and 10

   2: _____   5: _____   8: _____

   3: _____   6: _____   9: _____

   4: _____   7: _____   10: _____

Solve.

11. Sixty people are invited to a party. There are 24 cups in a package and 18 napkins in a package. What is the least number of packages of cups and napkins that can be bought if each party guest gets one cup and one napkin?

_____

12. The science club sponsor is ordering caps and shirts for the boys and girls in the science club. There are 45 science club members. If the caps come in packages of 3 and the shirts come in packages of 5, what is the least number of packages of caps and shirts that will need to be ordered?

_____

13. Some hot dogs come in packages of 8. Why would a baker of hot dog buns package 7 hot dog buns to a package?

_____

14. How are the GCF and the LCM alike and different?

_____

LESSON 4-2

Dividing Fractions

Practice and Problem Solving: A/B

RECIPROCAL= the opposite EX: $\frac{1}{3}$ → Reciprocal : $\frac{3}{1}$

Find the reciprocal.

1. $\frac{5}{7}$ _____

2. $\frac{3}{4}$ _____

3. $\frac{3}{5}$ _____

4. $\frac{1}{10}$ _____

5. $\frac{4}{9}$ _____

6. $\frac{13}{14}$ _____

7. $\frac{7}{12}$ _____

8. $\frac{3}{10}$ _____

9. $\frac{5}{8}$ _____

Divide. Write each answer in simplest form.

10. $\frac{5}{6} \div \frac{1}{2}$ _____

11. $\frac{7}{8} \div \frac{2}{3}$ _____

12. $\frac{9}{10} \div \frac{3}{4}$ _____

13. $\frac{3}{4} \div 9$ _____

14. $\frac{6}{9} \div \frac{6}{7}$ _____

15. $\frac{5}{6} \div \frac{3}{10}$ _____

16. $\frac{5}{6} \div \frac{3}{4}$ _____

17. $\frac{5}{8} \div \frac{3}{5}$ _____

18. $\frac{21}{32} \div \frac{7}{8}$ _____

Solve.

19. Mrs. Marks has $\frac{3}{4}$ pound of cheese to use making sandwiches.

She uses about $\frac{1}{32}$ pound of cheese on each sandwich. How many

sandwiches can she make with the cheese she has?

_____

20. In England, mass is measured in units called *stones*. One pound

equals $\frac{1}{14}$ of a stone. A cat weighs $\frac{3}{4}$ stone. How many pounds does

the cat weigh?

_____

21. Typographers measure font sizes in units called *points*. One point is

equal to $\frac{1}{72}$ inch. Esmeralda is typing a research paper on her

computer. She wants the text on the title page to be $\frac{1}{2}$ inch tall. What

font size should she use?

_____

1. Solve the equations. Check your solutions.

Solve	Check here:	Solve	Check here:
$15 = w + 4$		$a - 2 = 10$	
$3b = 21$		$\frac{1}{3}n = 13$	
$y - 7 = 12$		$34 = \frac{y}{2}$	
$\frac{a}{7} = 5$		$\frac{3}{7}n = 24$	
$4x = 24$		$w + 2 = 12$	

Vocabulary Check:

1. Operations that "undo" each other are called ___INVERSE OPERATIONS___

2. A mathematical sentence that contains an equal sign is an _____

3. The value of the variable that makes the equation true is called the ___SOLUTION___

4. A _____ is a symbol, usually a letter, used to represent an unknown number.

Solve	Check	Solve	Check
$7t = 49$		$15h = 75$	
$\frac{3}{4}x = 9$		$-d = -6$	
$-c = 25$		$5k = 25$	
$-12 = 2 + h$		$13 = -\frac{x}{2}$	
$k - 9 = -11$		$s - 4 = 12$	

Name : _____   Score : _____

Teacher : _____   Date : _____

Representation of Integers

Statement	Integer
	44
1) Sally grew 44 pumpkins on his farm.	
2) Nancy has 25 pennies in her bank.	———
3) Tim picked 18 plums at the orchard.	———
	−16
4) Mike lost 16 pounds after working out and dieting.	
5) Jessica had 30 baseball cards in his collection.	———
6) Tim went to 23 soccer games this year.	———
7) Tom placed 14 pencils on the table.	———
8) Benny lost 14 nickels because he did not put the money in his piggy bank.	———
9) The temperature fell 48 degrees overnight.	———
10) Mike found 17 seashells on the beach during his vacation.	———
	−49
11) The stock market dropped 49 points after the bad economic news yesterday.	
12) There are 25 dogwood trees currently in the park.	———
13) Sandy has to pay a 40 dollar penalty for driving too fast.	———
14) Sandy has 42 orange balloons in her collection.	———
15) Tom has 19 books in his library.	———

Name _____ Class _____ Date _____

Reteaching 11-1 ....

The numbers . . . −3, −2, −1, 0, +1, +2, +3, . . . are *integers*.
Integers are the set of positive whole numbers, their opposites, and 0.
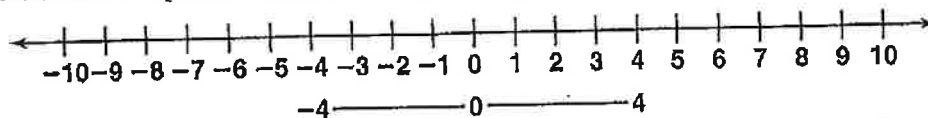
The absolute value of a number is its distance from 0 on a number
line. $|-4| = 4$. *Opposite integers*, like −4 and 4, are the same distance
from 0.

You can use integers to represent real-world situations. On the
Fahrenheit thermometer to the right, the temperature reads 5° below
zero. The integer −5 can be used to represent this situation.
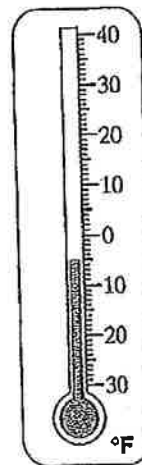
Write the opposite of each integer.

1. 7 _____

2. −212 _____

3. 49 _____

4. 1,991 _____

5. −78 _____

6. 16 _____

Find each absolute value.

7. $|-2|$

_____

8. $|-100|$

_____

9. $|-16|$

_____

10. $|16|$

_____

11. $|12|$

_____

12. $|75|$

_____

13. spend $20

_____

14. ride to the 12th floor on an elevator

_____

15. 8° below 0° Centigrade

_____

16. dive 10 feet below the water's surface

_____

17. earn $15

_____

18. gain of 1,400 feet in elevation

_____

Fill in the Missing Elements in the Table

USE A NUMBER LINE TO HELP!

Integer	One Less Than	One More Than
6	5	7
-8	-9	-7
-4		
7		
6		
-3		
1		
-1		
-7		
3		
-2		
4		
9		
-9		
8		
-6		
5		
2		
-5		
0		

Math-Aids.Com

⑧

Reteaching 11-2

You can use a number line to compare integers. For two integers on a
number line, the greater integer is farther to the right.

Compare −2 and 1.

① Locate −2 and 1 on the number line.

② Find that 1 is farther to the right.

③ Write 1 > −2 (1 is greater than −2),
   or −2 < 1 (−2 is less than 1).

−5−4−3−2−1 0 1 2 3 4 5
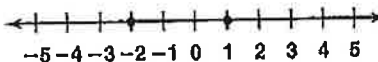
Compare, using < or >.

1. 7 ☐ −5

2. −9 ☐ −5

3. 6 ☐ −6

4. −12 ☐ 0

5. −33 ☐ 0

6. −11 ☐ −13

7. −5 ☐ 4

8. −3 ☐ −2

Order each set of integers from least to greatest.

9. −7, −9, −19, −8

   _____

10. 1, −5, 6, 8, −2

   _____

11. 5, −31, −4, −10

   _____

12. −2, −22, 10, −7

   _____

Write an integer that is located on a number line between the given integers.

13. −3, _____, 8

14. −24, _____, 22

15. −5, _____, 9

16. 0, _____, 4

17. −2, _____, 2

18. −17, _____, −15

Complete with an integer that makes the statement true.

19. −10 > _____

20. 0 > _____

21. −2 > _____

22. 5 < _____

23. −7 < _____

24. −36 < _____

Integer Operations

Integer Addition Rules:

- If the signs are alike, just add the numbers and make answer positive if both numbers are positive and negative if both are negative

  ex: 4 + 3 = 7

  ex: -4 + (-3) = -7

- If the signs are different, subtract the numbers and take sign of the larger number

  ex: 12 + (-3) = 9

  ex: 3 + (-12) = -9

Integer Subtraction Rules:

- Change the subtraction sign to addition and flip the sign of the number after the subtraction sign (if it was negative, make it positive & if it was positive, make it negative). Then just follow integer addition rules.

  ex: 5 – (-10)
  ⟶   5 + (+10) = 15

  ex: 5 – 10
  ⟶   5 + (-10) = -5

Integer Multiplication Rules:

- Positive · Positive = Positive

  ex: 5 · 4 = 20

- Negative · Negative = Positive

  ex: -5 · (-4) = 20

- Positive · Negative = Negative

  ex: 5 · (-4) = -20

- Negative · Positive = Negative

  ex: -5 · 4 = -20

Integer Division Rules:

- Positive ÷ Positive = Positive

  ex: 36 ÷ 4 = 9

- Negative ÷ Negative = Positive

  ex: -36 ÷ (-4) = 9

- Positive ÷ Negative = Negative

  ex: 36 ÷ (-4) = -9

- Negative ÷ Positive = Negative

  ex: -36 ÷ 4 = -9

Name _____ Class _____ Date _____

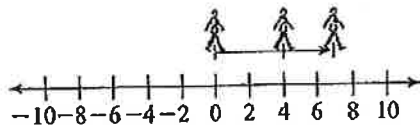# Reteaching 11-3 .... Adding Integers

You can add integers on a number line.

Example 1: Find $4 + 3$.

Start at 0. Move 4 units right and then 3 units right.

$-10\ -8\ -6\ -4\ -2\ \ 0\ \ 2\ \ 4\ \ 6\ \ 8\ \ 10$

$4 + 3 = 7$

Example 2: Find $-3 + -2$.

Start at 0. Move 3 units left and then 2 units left.

$-10\ -8\ -6\ -4\ -2\ \ 0\ \ 2\ \ 4\ \ 6\ \ 8\ \ 10$
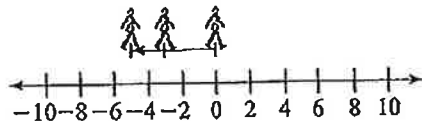
$-3 + (-2) = -5$

Example 3: Find $5 + (-3)$.

Start at 0. Move 5 units right and then 3 units left.

$-10\ -8\ -6\ -4\ -2\ \ 0\ \ 2\ \ 4\ \ 6\ \ 8\ \ 10$
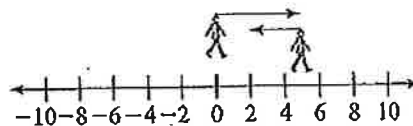
$5 + (-3) = 2$

Example 4: Find $-4 + 1$.

Start at 0. Move 4 units left and then 1 unit right.

$-10\ -8\ -6\ -4\ -2\ \ 0\ \ 2\ \ 4\ \ 6\ \ 8\ \ 10$

$-4 + 1 = -3$

$-20\quad\quad -15\quad\quad -10\quad\quad -5\quad\quad 0\quad\quad 5\quad\quad 10\quad\quad 15\quad\quad 20$
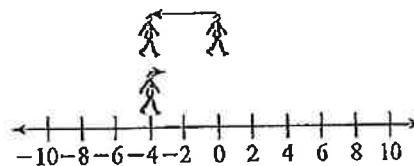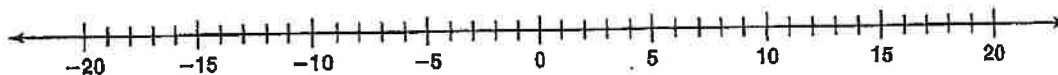
Use the number line to find each sum. *Do the odds. Examples of evens on Google Classroom.*

1. $-4 + (-8)$ _____

2. $4 + (-1)$ _____

3. $-6 + 8$ _____

4. $-7 + 3$ _____

5. $-5 + 8$ _____

6. $3 + 5$ _____

7. $-3 + (-5)$ _____
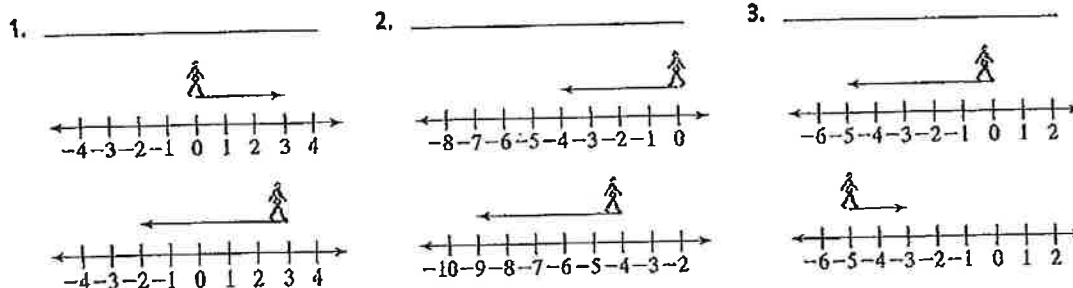
8. $3 + (-5)$ _____

9. $-3 + 5$ _____

Find each sum.

10. $-14 + (-5)$ _____

11. $5 + (-12)$ _____

12. $-9 + 9$ _____

13. $18 + (-18)$ _____

14. $0 + (-4)$ _____

15. $6 + 0$ _____

16. $15 + (-15)$ _____

17. $-12 + 0$ _____

18. $-9 + 10$ _____

19. $12 + (-11)$ _____

20. $-12 + 11$ _____

21. $2 + (-10)$ _____

(19)

Practice 11-3 .... Adding Integers

Write a numerical expression for each model. Find each sum.

1. _____   2. _____   3. _____

Use a number line or mental math to find each sum.

4. −2 + (−8) _____   5. 8 + (−4) _____   6. −6 + 3 _____

7. −2 + (−6) _____   8. 6 + (−9) _____   9. −5 + (−7) _____

Compare. Write <, =, or >.

10. −5 + (−6) ☐ 6 + (−5)   11. −8 + 10 ☐ −3 + 6

12. −4 + (−9) ☐ −8 + (−5)   13. 20 + (−12) ☐ −12 + (−4)

Solve.

14. Bill has overdrawn his account by $15. There is a $10 service charge for an overdrawn account. If he deposits $60, what is his new balance?

_____

15. Jody deposited $65 into her savings account. The next day, she withdrew $24. How much of her deposit remains in the account?

_____

16. The outside temperature at noon was 9°F. The temperature dropped 15 degrees during the afternoon. What was the new temperature?

_____

17. The temperature was 10° below zero and dropped 24 degrees. What is the new temperature?

_____

18. The high school football team lost 4 yards on one play and gained 9 yards on the next play. What is the total change in yards?

_____

19. Philip earned $5 for shoveling snow and received $8 allowance. He spent $6 at the movies. How much money does he have left?
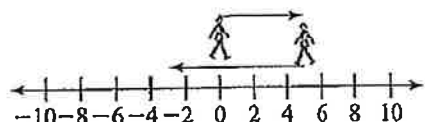
_____

20

Reteaching 11-4 ....

To subtract an integer, add the opposite.
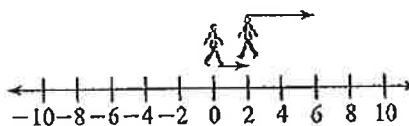
Example 1: Subtract 5 − 8.
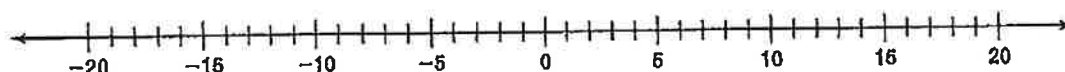
Add the opposite: 5 + (−8)

$$5 - 8 = -3$$

Example 2: Subtract 2 − (−4).

Add the opposite: 2 + 4

$$2 - (-4) = 6$$

Do the odds. Examples of evens on Google Classroom.

Use a number line. Find each difference.

1. 3 − (−6) _____

2. 2 − (−4) _____

3. −1 − 2 _____

4. −3 − (−5) _____

5. −8 − (−3) _____

6. 4 − (−4) _____

7. −8 − 2 _____

8. 8 − (−2) _____

9. −8 − (−2) _____

10. −7 − 4 _____

11. −10 − 2 _____

12. −5 − (−5) _____

13. −5 − 6 _____

14. 9 − (−3) _____

15. −11 − (−6) _____

Find each difference.

16. 15 − (−4) _____

17. −12 − 3 _____

18. 21 − (−7) _____

19. 3 − (−12) _____

20. −2 − 10 _____

21. −13 − 13 _____

22. 5 − (−5) _____

23. 18 − (−10) _____

24. −7 − (−13) _____

25. 14 − 16 _____

26. 3 − 15 _____

27. −6 − (−9) _____
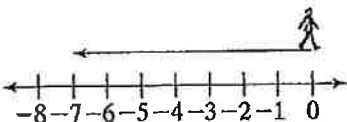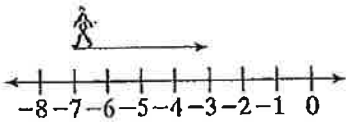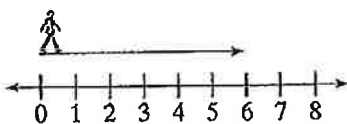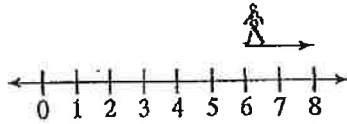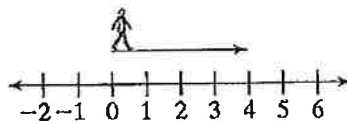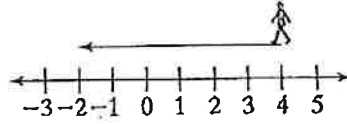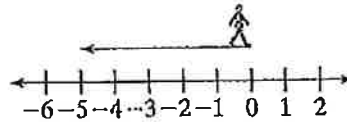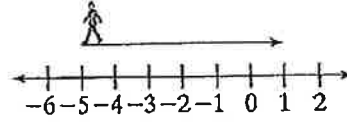
Name _____ Class _____ Date _____

Practice 11-4 · Subtracting Integers

Write a numerical expression for each model. Find each difference.

1.

number lines

_____

2.

number lines

_____

3.

number lines

_____

4.

number lines

_____

Find each difference.

5. $2 - 5$ _____

6. $-5 - 2$ _____

7. $-6 - 3$ _____

8. $10 - (-3)$ _____

9. $-9 - (-2)$ _____

10. $0 - (-5)$ _____

Compare using <, =, or >.

11. $5 - 12$ ☐ $5 - (-12)$

12. $8 - (-5)$ ☐ $-8 - 5$

13. $9 - (-4)$ ☐ $4 - (-9)$

14. $-12 - 12$ ☐ $12 - (-12)$

Solve.

15. The temperature was 48°F and dropped 15° in two hours.
   What was the temperature after the change?   _____

16. The temperature at midnight is −5°C and is expected to drop 12°
   by sunrise. What is the expected temperature at sunrise?   _____

17. Catherine has $400 in her checking account. She writes a check for
   $600. What is the balance in her account?   _____

18. On the first play, the football team lost 6 yards. On the second play,
   the team lost 5 yards. What was their total change in yards? _____

㉓

Solve each equation. *Do the odds. Examples of evens on Google Classroom.*

1.	$x = -7 + (-5)$		2.	$10 + 9 = n$	
3.	$w = \lvert -12 \rvert + (-5)$		4.	$t = \lvert -13 \rvert + (-3)$	
5.	$\lvert -10 \rvert + \lvert 12 \rvert = z$		6.	$\lvert -7 \rvert + \lvert 8 \rvert = k$	
7.	$m = -11 + (-6)$		8.	$0 + (-21) = b$	
9.	$\lvert -13 \rvert + \lvert (-11) \rvert = h$		10.	$f = -52 + 52$	
11.	$6 + 5 + (-4) = t$		12.	$\lvert -4 \rvert + (-5) + \lvert 6 \rvert = m$	
13.	$k = -3 + 8 + (-9)$		14.	$a = \lvert -6 + (-2) + (-1) \rvert$	
15.	$10 + (-5) + 6 = n$		16.	$c = -8 + 8 + (-10)$	
17.	$36 + (-28) + (-16) + 24 = y$		18.	$x = -31 + 19 + (-15) + (-6)$	

Solve each equation.

19.	$-4 - 1 = f$		20.	$h = -5 - (-7)$	
21.	$z = 9 - 12$		22.	$a = -765 - (-34)$	
23.	$652 - (-57) = b$		24.	$c = 346 - 865$	
25.	$d = -136 - (-158)$		26.	$x = 342 - (-456)$	
27.	$y = -684 - (-379)$		28.	$b = -658 - 867$	
29.	$657 - 899 = t$		30.	$3004 - (-1007) = r$	
31.	$-21 - 24 = b$		32.	$-15 - (-86) = a$	

Tell if each of the subtraction sentences would always, sometimes, or never be true. Support your answer with examples.

33.	positive – positive = positive		34.	negative – positive = negative	
35.	negative – negative = positive		36.	positive – negative = negative	
37.	negative – positive = positive		38.	positive – positive = negative	

Name _____ Class _____ Date _____

Reteaching 11-5 .... Multiplying Integers

When two integers have like signs, the product will always be positive.

Both integers are positive: $\quad 3 \times 4 = 12$
Both integers are negative: $\quad -3 \times (-4) = 12$

When two integers have different signs, the product will always be negative.

One integer positive, one negative: $\quad 3 \times (-4) = -12$
One integer negative, one positive: $\quad -3 \times 4 = -12$

Example 1: Find -8×3.

① Determine the product.
$\quad 8 \times 3 = 24$

② Determine the sign of the product. Since one integer is negative and one is positive, the product is negative.

③ So $-8 \times 3 = -24$.

Example 2: Find $(-10) \times (-20)$.

① Determine the product.
$\quad 10 \times 20 = 200$

② Determine the sign of the product. Since both integers are negative, the product is positive.

③ So $(-10) \times (-20) = 200$.

Find each product.

1. $7 \times (-4)$ _____

2. $-5 \times (-9)$ _____

3. -11×2 _____

4. $8 \times (-9)$ _____

5. $15 \times (-3)$ _____

6. $-7 \times (-6)$ _____

7. -12×6 _____

8. $13 \times (-5)$ _____

9. $-10 \times (-2)$ _____

10. A dog lost 2 pounds per week three weeks in a row. What integer expresses the total change in the dog's weight? _____

Find each quotient.

11. $18 \times (-6)$ _____

12. $-35 \times (-7)$ _____

13. -15×3 _____

14. $28 \times (-4)$ _____

15. $25 \times (-5)$ _____

16. $-27 \times (-9)$ _____

17. -12×4 _____

18. $33 \times (-11)$ _____

19. $-50 \times (-2)$ _____

Practice 11-5

Multiplying Integers

Use a number line to find each product.

1. 5×2

2. -4×3

3. $6 \times (-2)$

4. $-3 \times (-2)$

_____   _____   _____   _____

Find each product.

5. 7×8

6. -5×7

7. $4 \times (-8)$

8. $-8 \times (-2)$

_____   _____   _____   _____

9. $11 \times (-6)$

10. -7×6

11. $-8 \times (-8)$

12. 10×4

_____   _____   _____   _____

Find each product.

13. $11 \times (-9) \times (-4)$ _____

14. $-6 \times (-5) \times (-1)$ _____

15. $5 \times 7 \times (-2) \times 3$ _____

16. $-3 \times 6 \times (-4) \times 5$ _____

Solve.

17. Your teacher purchases 24 pastries for a class celebration, at $2 each. What integer expresses the amount he paid?

_____

18. Temperatures have been falling steadily at 5°F each day. What integer expresses the change in temperature in degrees 7 days from today?

_____

19. A submarine starts at the surface of the Pacific Ocean and descends 60 feet every hour. What integer expresses the submarine's depth in feet after 6 hours?

_____

20. A skydiver falls at approximately 10 meters per second. Write a number sentence to express how many meters he will fall in 40 seconds.

_____

Reteaching 11-6

When two integers have like signs, the quotient will always be positive.

Both integers are positive: $8 \div 2 = 4$
Both integers are negative: $-8 \div (-2) = 4$

When two integers have different signs, the quotient will always be negative.

One integer positive, one negative: $8 \div (-2) = -4$
One integer negative, one positive: $-8 \div 4 = -2$

Example 1: Find $-24 \div 8$.

① Determine the quotient.
   $24 \div 8 = 3$

② Determine the sign of the quotient. Since one integer is negative and one is positive, the quotient is negative.

③ So, $-24 \div 8 = 3$.

Example 2: Find $35 \div (-7)$.

① Determine the quotient.
   $35 \div 7 = 5$

② Determine the sign of the quotient. Since one integer is positive and one is negative, the quotient is negative.

③ So, $35 \div (-7) = -5$.

Find each quotient.

1. $18 \div (-6)$

   _____

2. $-35 \div (-7)$

   _____

3. $-15 \div 3$

   _____

4. $28 \div (-4)$

   _____

5. $25 \div (-5)$

   _____

6. $-27 \div (-9)$

   _____

7. $-12 \div 4$

   _____

8. $33 \div (-11)$

   _____

9. $-50 \div (-25)$

   _____

Find the rate of change for each situation.

10. The water level in a lake rises 12 inches in 4 days.

    _____

11. The temperature drops 40° as you rise
    4 kilometers into the air.

    _____

12. A dog grows 24 inches in 12 months. _____

13. A diver descends 120 feet in 6 minutes. _____

14. A ship sinks 90 feet in 10 seconds. _____

Reteaching

Name _____ Class _____ Date _____

Practice 11-6

Find each quotient.

1. $14 \div 7$

2. $21 \div (-3)$

3. $-15 \div 5$

4. $-27 \div (-9)$

_____ _____ _____ _____

5. $45 \div (-9)$

6. $-42 \div 6$

7. $-105 \div (-15)$

8. $63 \div (-9)$

_____ _____ _____ _____

9. $108 \div 6$

10. $-204 \div 17$

11. $240 \div (-15)$

12. $-252 \div (-12)$

_____ _____ _____ _____

13. $-286 \div 13$

14. $320 \div 16$

15. $-378 \div (-14)$

16. $380 \div (-19)$

_____ _____ _____ _____

Represent each rate of change with an integer.

17. spends $300 in 5 days

18. runs 800 feet in 4 minutes

_____ _____

19. descends 45 yards in 15 seconds

20. lose 26 ounces of baby fat in 13 months

_____ _____

21. Juan's baseball card collection was worth $800. Over the last 5 years, the collection decreased $300 in value. What integer represents the average decrease in value each year?

_____

22. Florence purchased stock for $20 per share. After 6 days, the stock is worth $32 per share. What integer represents the average increase in stock value each day?

_____

23. A freight train starts out at 0 miles per hour. After 15 miles the train is traveling 90 miles per hour. What integer represents the average increase in speed per mile?

_____

Key Vocabulary
statistics, *p. 392*
statistical question, *p. 392*

Statistics is the science of collecting, organizing, analyzing, and interpreting data. A **statistical question** is one for which you do not expect to get a single answer. Instead, you expect a variety of answers, and you are interested in the distribution and tendency of those answers.

Recall that a dot plot uses a number line to show the number of times each value in a data set occurs. Dot plots show the *spread* and the *distribution* of a data set.
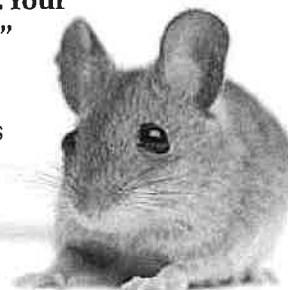
EXAMPLE 1 Answering a Statistical Question

You conduct a science experiment on house mice. Your teacher asks you, "What is the weight of a mouse?"

a. **Is this a statistical question? Explain.**

∴ Because you can anticipate that the weights of mice will vary, it is a statistical question.

Weights (grams)

20	19	21	20
18	20	27	21
28	23	20	19
20	21	18	27
19	22	21	20

b. **You weigh some mice and record the weights (in grams) in the table. Display the data in a dot plot. Identify any clusters, peaks, or gaps in the data.**

Draw a number line that includes the least value, 18, and greatest value, 28. Then place a dot above the number line for each data value.
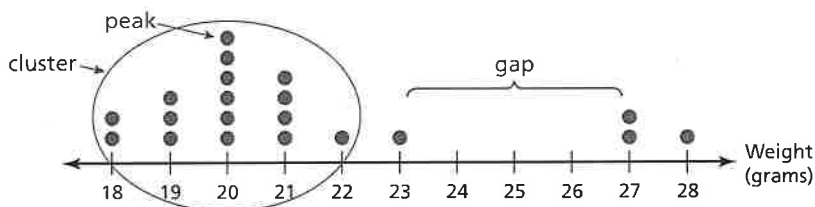

Most of the data are clustered around 20. There is a peak at 20 and a gap between 23 and 27.

c. **Use the distribution of the data to answer the question.**

∴ Most mice weigh about 20 grams.

Study Tip
Dot plots are sometimes called *line plots*. It is easy to see clusters, peaks, and gaps in a dot plot.

On Your Own

Now You're Ready
Exercises 8–16

1. The table shows the ages of some people who retired early. You are asked, "How old are people who retire early?"

   a. Is this a statistical question? Explain.

   b. Display the data in a dot plot. Identify any clusters, peaks, or gaps in the data.

   c. Use the distribution of the data to answer the question.

Ages

60	61	59	60
62	56	64	59
58	60	61	60
59	60	58	61

Name:

Determine if the question posed is a statistical question (yes) or not (no).

1) How many cars are in each driveway on your street?

2) How many people think Elvis is the best singer?

3) How many boxes of candy did each student sell?

4) How many cities had more than 2" of snow?

5) How many girls are in your class?

6) How many leaves did each branch have on it?

7) How many presidents were under 50 when inaugurated?

8) How many times did you eat lunch this month?

9) How many apps do my classmates have on their phones?

10) How many branches does the oak tree have?

11) How many cars were sold each day this month?

12) How many people in the office are wearing ties?

13) How many cars were sold this month?

14) How much money did the different classes earn?

15) How many brothers does each classmate have?

16) How many pets does each person on your block own?

17) How old are the paintings in the museum?

18) How old is the painting, 'The Mona Lisa'?

19) What were the students scores for the math test?

20) How many cars are in your driveway?

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

11. _____

12. _____

13. _____

14. _____

15. _____

16. _____

17. _____

18. _____

19. _____

20. _____

1-10	95	90	85	80	75	70	65	60	55	50
11-20	45	40	35	30	25	20	15	10	5	0

You record the high temperature every day while at summer camp in August. Then you create the vertical dot plot.

a. **How many weeks were you at summer camp?**

Because there are 28 data values on the dot plot, you were at camp 28 days.

$$28 \text{ days} \cdot \frac{1 \text{ week}}{7 \text{ days}} = 4 \text{ weeks}$$

∴ So, you were at summer camp for 4 weeks.
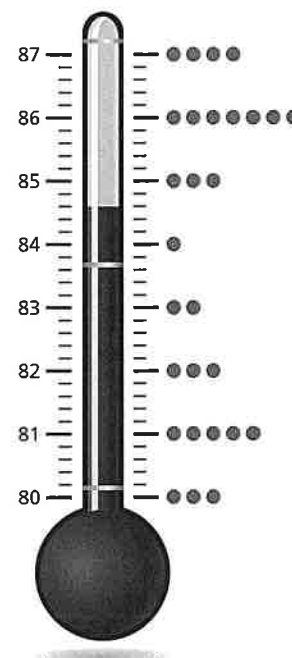
b. **How can you collect these data? What are the units?**

∴ You can collect these data with a thermometer. The units are degrees Fahrenheit (°F).

c. **Write a statistical question that you can answer using the dot plot. Then answer the question.**

One possible statistical question is:
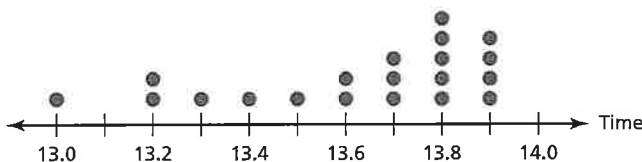
What is the daily high temperature in August?

∴ The high temperatures are spread out with about half of the temperatures around 81°F and half of the temperatures around 86°F.

On Your Own

Now You're Ready
Exercises 17 and 18

2. The dot plot shows the times of sixth grade students in a 100-meter race.

a. How many students ran in the race?

b. How can you collect these data? What are the units?

c. Write a statistical question that you can answer using the dot plot. Then answer the question.

LESSON
16.3

Box Plots

Reteach

A **box plot** gives you a visual display of how data are distributed.

Here are the scores Ed received on 9 quizzes: 76, 80, 89, 90, 70, 86, 87, 76, 80.

**Step 1:** List the scores in order from least to greatest.

Step 2: Identify the least and greatest values.

Step 3: Identify the median.
If there is an odd number of values, the median is the middle value.

70 76 76 80 80 86 87 89 90

least   greatest
              median
     lower   upper
     quartile   quartile

Step 4: Identify the lower quartile and upper quartile. If there is an even number of values above or below the median, the lower or upper quartile is the average of the two middle values.

Step 5: Draw a number line that includes the values in the given data.

68 70 72 74 76 78 80 82 84 86 88 90 92
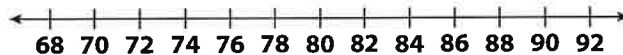
Step 6: Place dots above the number lines at each value you identified in Steps 2–4. Draw a box starting at the lower quartile and ending at the upper quartile. Mark the median, too.

68 70 72 74 76 78 80 82 84 86 88 90 92
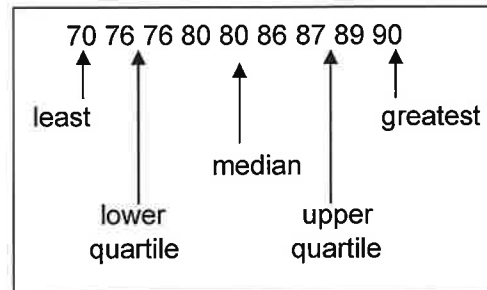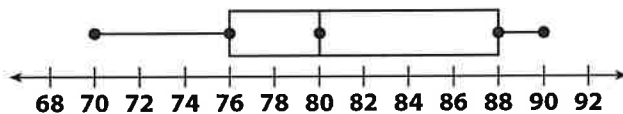
Use the data at the right for Exercises 1–5. Complete each statement.

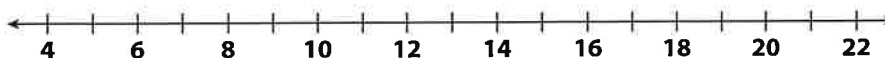| 20	6	15
10	14	15
8	10	12

1. List the data in order: _____

2. Least value: _____ Greatest value: _____

3. Median:_____

4. Lower quartile:_____ Upper quartile:_____

5. Draw a box plot for the data.

4   6   8   10   12   14   16   18   20   22

LESSON	**Box Plots**
16-3	

Practice and Problem Solving: A/B

The high temperatures for 2 weeks are shown at the right. Use the data set for Exercises 1–7.

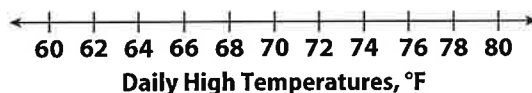| **High Temperatures** |
|-----------------------|
| 69 73 72 66 64 64 61 |
| 70 78 78 74 69 61 62 |

1. Order the data from least to greatest.

   _____

2. Find the median. _____

3. Find the lower quartile. _____

4. Find the upper quartile. _____

5. Make a box plot for the data.

   60 62 64 66 68 70 72 74 76 78 80
   Daily High Temperatures, °F

6. Find the IQR. _____   7. Find the range. _____

Use the situation and data given below to complete Exercises 8–10.

Two classes collected canned food for the local food bank. Below are the number of cans collected each week.

   Class A: 18 20 15 33 30 23 38 34 40 28 18 33

   Class B: 18 27 29 20 26 26 29 30 24 28 29 28

8. Arrange the data for each class in order from least to greatest.

   Class A: _____

   Class B: _____

9. Find the median, the range, and the IQR of each data set.

   Class A: median:_____ range:_____ IQR:_____

   Class B: median:_____ range:_____ IQR:_____

10. Make box plots for the two data sets. Then, compare and contrast the data. Use extra paper if needed.

Reteaching Page
6.2 Mean, Median, Mode and Range

Mean, Median, Mode and Range are ways to describe a data set. (averages)

1. **The first thing to do is to put the data in order from least to greatest!**

2. **Follow the processes for each of the descriptors.**

Mean –

1. Find the Sum of the data.
2. Divide by the number of items in the data set.

Median –

1. Put the data in order from least to greatest.
2. Find the middle term.
    In the event that there are two terms in the middle – find the average of the 2 terms

---

Mode –

1. Find the term that occurs the most often.
2. In the event that no term occurs more often than the others – the answer is **no mode.**

{1, 1, 2, 2, 3, 3} No term occurs more often so it is no mode.
{1, 1, 2, 3, 3} One and three occur more often than 2 so the answer is 1 and 3.

Range –

1. Subtract the **least** value from the **greatest** value.

Follow the procedures to find the Mean, Median, Mode and Range of the following data set.

Bill's Bowling Scores			
75	96	101	84

_____ = Mean

_____ = Median

_____ = Mode

_____ = Range

Step 1.   75, 84, 96, 101

Mean: $75 + 84 + 96 + 101 = 356$

$356 \div 4 = 89$

Median: The middle numbers are 84 and 96.

$84 + 96 = 180$

$180 \div 2 = 90$

Mode: No data occurs more often that the others.

Range: $101 - 75 = 26$
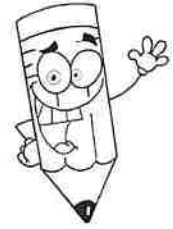
Mean, Median and Mode Worksheet

Find the mean, median and mode for each set of numbers.

① 32, 33, 22, 85, 58

Mean : _____ Median : _____

Mode : _____

② 18, 18, 26, 36, 64,

Mean : _____ Median : _____

Mode : _____

③ 58, 84, 90, 90, 97

Mean : _____ Median : _____

Mode : _____

④ 9, 15, 28, 10, 8

Mean : _____ Median : _____

Mode : _____

⑤ 21, 15, 16, 25, 13, 18

Mean : _____ Median : _____

Mode : _____

⑥ 53, 44, 10, 45, 59, 97, 77

Mean : _____ Median : _____

Mode : _____

⑦ 5, 3, 2, 6, 5, 2, 5

Mean : _____ Median : _____

Mode : _____

⑧ 6, 6, 6, 7, 7, 5, 4

Mean : _____ Median : _____

Mode : _____

⑨ 9, 19, 16, 9, 16, 2, 14, 8, 2

Mean : _____ Median : _____

Mode : _____

⑩ 19, 5, 9, 12, 10, 5

Mean : _____ Median : _____

Mode : _____