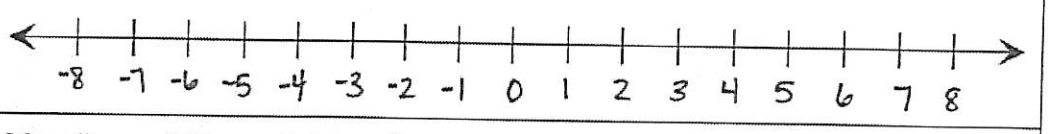
Summer Homework Notes

HW 1

Name: Do not turn these in | Date:

Topic: These are for reference | Class:

Main Ideas/Questions	Notes/Examples
What are Integers?	Whole numbers (0, 1, 2, 3, ...) and their opposites.
The Number Line	
Writing Integers	**Directions:** Write an integer for each situation.

1. a $15 tax	15	2. a $12 refund	-12
3. a $32 withdraw	-32	4. a 21-pound loss	-21
5. 340 feet under water	-340	6. a $135 commission	135
7. a baby born 2 days late	2	8. a $5 check is written	-5

Absolute Value

the distance from zero on a number line

Notation: $|x|$ ← **Read as:** "The absolute value of x."

Directions: Evaluate each expression.

9. $\|-17\| = 17$	10. $\|42\| = 42$	11. $\|100\| = 100$	12. $\|-8\| = 8$
13. $\|15\| = 15$	14. $\|-102\| = 102$	15. $\|16\| = 16$	16. $\|-18\| = 18$

Comparing & Ordering Integers

Directions: Order each set of integers from least to greatest.

17. {-3, 2, -1, 5, -4, -6, 0} {-6, -4, -3, -1, 0, 2, 5}

18. {-8, 15, -14, -13, -21, -12} {-21, -14, -13, -12, -8, 15}

19. {32, 19, -20, -30, -16, 22} {-30, -20, -16, 19, 22, 32}

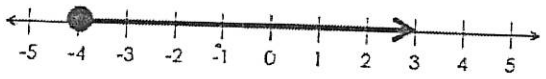
Directions: Place a < or > in the circle to complete each statement.

20. -2 (<) 5	21. 25 (>) -23	22. 10 (>) -26	23. -8 (<) -3
24. $\|13\|$ (>) −25	25. −2 (<) $\|-7\|$	26. $\|8\|$ (>) $\|-3\|$	27. $\|-9\|$ (>) $\|-6\|$

Adding Integers

- To **ADD** means to move Right on the number line!

Visual Example: $-4 + 7 =$ 3



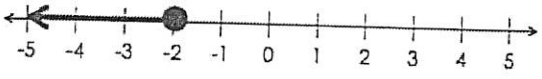
More Examples:

28. $5 + 3 =$ 8
29. $-1 + 3 =$ 2
30. $-9 + 4 =$ -5
31. $-22 + 12 =$ -10
32. $-11 + 5 =$ -6
33. $-3 + 18 =$ 15

Subtracting Integers

- To **SUBTRACT** means to move Left on the number line!

Visual Example: $-2 - 3 =$ -5



More Examples:

34. $6 - 8 =$ -2
35. $-12 - 6 =$ -18
36. $14 - 7 =$ 7
37. $-5 - 10 =$ -15
38. $-8 - 2 =$ -10
39. $-9 - 1 =$ -10

Applications

40. The water level at Lake Willow was -14 feet. After 3 days of rain, the water level rose by 23 feet. What is the water level after the rain?

$-14 + 23 =$ 9 ft

41. Blair's bank account was overdrawn by $40. She spent $30 at the grocery store. What is the balance in her account now?

$-40 - 30 =$ -$70

42. Peter sets out on a run 4 miles west of his school. He ran 14 miles east. How far past is school is he after his run?

$-4 + 14 =$ 10 mi east

43. Mason is skiing with friends. He starts at an elevation of 420 feet. He descends 600 feet down the mountain into a valley. What is his elevation when he stops?

$420 - 600 =$ -180 ft

44. The lava in a volcano rests 220 feet below sea level. When the volcano erupts, the lava shoots 930 feet upward. How high does the lava reach before it starts to fall?

$-220 + 930 =$ 710 ft

45. Bryce rides his bike four blocks west to school. After school he rides six blocks east to the grocery store. How many blocks past his house is Bryce when he arrives at the grocery store?

$-4 + 6 =$ 2 blocks

HW 2

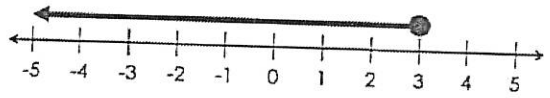
Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples

Adding Negatives

- Rewrite "+(-)" as subtraction.

Visual Example: $3+(-8) = -5$



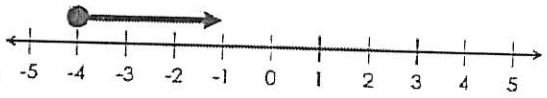
More Examples:

1. $11+(-8) = 11-8 = 3$
2. $-10+(-9) = -10-9 = -19$
3. $-8+(-6) = -14$
4. $-7+(-7) = -14$
5. $-2+(-3) = -5$
6. $-12+(-13) = -25$
7. $-9+(-6) = -15$
8. $-5+(-13) = -18$

Subtracting Negatives

- Rewrite "-(-)" as addition.

Visual Example: $-4-(-3) = -1$



More Examples:

9. $7-(-1) = 7+1 = 8$
10. $-17-(-2) = -17+2 = -15$
11. $-9-(-2) = -7$
12. $-1-(-9) = 8$
13. $-11-(-9) = -2$
14. $-9-(-3) = -6$
15. $-15-(-5) = -10$
16. $-10-(-3) = -7$

Mixed Practice

Examples:

17. $12+(-4) = 8$
18. $-7+(-10) = -17$
19. $-10+(-6) = -16$
20. $18+(-16) = 2$
21. $-5+(-4) = -9$
22. $13+(-9) = 4$
23. $19-(-12) = 31$
24. $-22-(-6) = -16$
25. $10-(-10) = 20$
26. $-3-(-9) = 6$
27. $-5-(-23) = 18$
28. $2-(-7) = 9$

Applications

29. Kelcie has $42 in her checking account and -$65 in her savings account. How much money does she have altogether?

$42 + (-65)$
$= 42 - 65 =$ $\boxed{\$-23}$

30. The water level in Mr. Jacob's pond was -4 feet. After a drought, the water level dropped by 13 feet. What is the water level after the drought?

$-4 + (-13)$
$= -4 - 13 =$ $\boxed{-17 \text{ ft}}$

31. Kyra is playing a card game. Black cards are worth points while red cards take points away. What is her score if she has a black 20 card and a red 42 card?

$20 + (-42)$
$= 20 - 42 =$ $\boxed{-22 \text{ pts}}$

32. Mount Everest is 29,028 feet above sea level. The bottom of the Mariana Trench is 36,070 feet below sea level. What is the difference between these two elevations?

$29028 - (-36070)$
$= 29028 + 36070 =$ $\boxed{65098 \text{ ft}}$

33. A football team completed three plays. They gained 15 yards, lost 12 yards and lost another 3 yards. What was their total change in field position?

$15 + (-12) = 3$
$3 + (-3) =$ $\boxed{0 \text{ yds}}$

34. Pete is on the 23rd floor of a hotel. His car is parked 6 floors underground in the parking garage. What is the difference in floors between Pete and his car?

$23 - (-6)$
$= 23 + 6 =$ $\boxed{29 \text{ floors}}$

35. Kailyn is flying to Alaska. When she boarded her plane in Texas the temperature was 82°. When she landed in Alaska the temperature was -4°. Find the change in temperature.

$82 - (-4) =$ $\boxed{86^\circ}$

36. A shark is being tracked with a fin tag. The shark is swimming steadily 32 feet below the surface before ascending 5 feet and quickly descending 13 feet. What is the total change in the shark's position underwater?

$5 + (-13) = 5 - 13 =$ $\boxed{-8 \text{ ft}}$

37. Mr. Phillips' investment account lost $50, gained $200 and then lost $400. What was the total change in the amount of money in Mr. Phillips' investment account?

$-50 + 200 = 150$
$150 + (-400) =$ $\boxed{-\$250}$

38. The distance between a skiier on the top of a mountain and the end of the ski course is 2,395 feet. If the end of the course is 642 feet below sea level, what is the elevation of skiier at the top of the mountain?

$2395 - 642 =$ $\boxed{1753 \text{ ft}}$

39. Nina has $40 in the bank. She writes a check for $63, deposits $80 and writes another check for $140. What is her balance?

$40 + (-63) = -23$
$(-23) + 80 = 57$
$57 + (-140) =$ $\boxed{\$-83}$

40. The golfer who won the Masters Tournament had final scores of -4, -5, -1 and 4. What was his final score?

$-4 + (-5) = -9$
$-9 + (-1) = -10$
$-10 + 4 =$ $\boxed{-6}$

HW3

Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples

Rules for Multiplying & Dividing Integers

Multiply or divide as you normally would, but use the following rules for the final sign:

- Two Positives (+ and +) make a positive.
- Two Negatives (– and –) make a positive.
- A Positive and a Negative (+ and –) or (– and +) make a negative.

Multiplying Integers

Directions : Find each product.

1. $-2 \times -7 =$ 14
2. $-3 \times -10 =$ 30
3. $3(-8) =$ -24
4. $-4(1) =$ -4
5. $-5(-2) =$ 10
6. $3(15) =$ 45
7. $12 \cdot -4 =$ -48
8. $-4 \cdot -8 =$ 32

Dividing Integers

Directions : Find each quotient.

9. $44 \div 4 =$ 11
10. $-180 \div -6 =$ 30
11. $-12 \div -2 =$ 6
12. $-40 \div 5 =$ -8
13. $\frac{120}{10} =$ 12
14. $\frac{72}{-2} =$ -36
15. $\frac{-16}{8} =$ -2
16. $\frac{-27}{3} =$ -9
17. $\frac{-21}{7} =$ -3
18. $\frac{19}{-1} =$ -19

Applications

19. Nina made 8 withdrawls from her bank account. Each withdraw was for $20. What was the total change in her bank account?

$8(-20) = -160$

-$160

20. The Tigers, a high school football team, lost 3 yards on their last 3 plays. What was their total change in yards?

$-3(3) = -9$

-9 yds

21. A skiier descended down a mountain at a rate of 14 feet per second. What was his total change in elevation after 8 seconds?

$-14(8) = -112$

$\boxed{-112 \text{ feet}}$

22. Jorge has $24 on a gift card. He only uses the gift card to buy $1.75 cups of coffee. What is the total change in the amount on the gift card after he buys 9 cups osf coffee?

$1.75(9) = 15.75$

$\boxed{\$15.75}$

23. Andrew's bank account changed by -$50 after making four equal withdraws. How much was each withdraw?

$\frac{-50}{4} = -12.5$

$\boxed{\$12.50/\text{withdrawl}}$

24. After 8 hours of snow, the temperature had changed by a total of -16°. What was the average change in temperature each hour while it was snowing?

$\frac{-16}{8} = -2$

$\boxed{-2°/\text{hr}}$

25. A dinner bill total came to $64. Eight friends each use a debit card to split the bill. What will be the change in the bank account of each friend who helped pay for dinner?

$\frac{64}{8} = \boxed{\$8/\text{person}}$

26. A well is being dug into the ground. The well needs to reach a depth of 120 feet. A machine can dig down that far in 12 minutes. What is the change in depth each minute the machine is digging?

$\frac{-120}{12} = \boxed{-10 \text{ ft/min}}$

27. The amount of water in a lake decreased by 12.8 feet over the last 4 weeks. How much did the water level change by each week?

$\frac{-12.8}{4} = \boxed{-3.2 \text{ ft/wk}}$

28. Due to erosion, a beach is disappearing at a rate of -5 feet per year. How long will it take for the beach to lose 85 feet?

$\frac{-85}{-5} = \boxed{17 \text{ years}}$

Summary: _____

HW 4

Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples
Parts of a Fraction	Numerator → $\frac{5}{6}$ ← Denominator A **rational number** is a number that can be written as the ratio of two integers.
Simplest Form	A fraction than cannot be simplified any further.
Examples	**Directions:** Write each fraction in simpest form.

1. $\frac{4}{30} = \frac{2}{15}$	2. $-\frac{2}{14} = -\frac{1}{7}$	3. $\frac{15}{40} = \frac{3}{8}$
4. $-\frac{22}{34} = -\frac{11}{17}$	5. $-\frac{10}{62} = -\frac{5}{31}$	6. $\frac{18}{24} = \frac{3}{4}$
7. $\frac{9}{108} = \frac{1}{12}$	8. $\frac{14}{30} = \frac{7}{15}$	9. $-\frac{6}{40} = -\frac{3}{20}$

Improper Form	A fraction in which the numerator is larger than the denominator.
Mixed Numbers	A number paired with a proper fraction.
Examples	**Directions:** Write each improper fraction as a mixed number.

10. $\frac{16}{4} = 4$	11. $-\frac{28}{16} = -1\frac{12}{16} = -1\frac{3}{4}$	12. $\frac{18}{5} = 3\frac{3}{5}$
13. $\frac{23}{4} = 5\frac{3}{4}$	14. $\frac{11}{6} = 1\frac{5}{6}$	15. $-\frac{42}{9} = -4\frac{6}{9} = -4\frac{2}{3}$

Directions: Write each mixed number as an improper fraction.

16. $2\frac{2}{9} = \frac{20}{9}$	17. $-5\frac{1}{3} = \frac{-16}{3}$	18. $3\frac{3}{7} = \frac{24}{7}$
19. $-4\frac{1}{4} = \frac{-17}{4}$	20. $6\frac{1}{8} = \frac{49}{8}$	21. $-11\frac{1}{2} = -\frac{23}{2}$

Adding & Subtracting Fractions

1	Write all mixed numbers as improper fractions.
2	Add/Subtract the numberators and keep the denominator the same.
3	Simplify (if needed).

Examples

22. $\frac{1}{12}+\frac{5}{12} = \frac{6}{12}$

$= \boxed{\frac{1}{2}}$

23. $\frac{11}{15}-\frac{4}{15} = \boxed{\frac{7}{15}}$

24. $\frac{5}{3}+\frac{2}{3} = \boxed{\frac{7}{3}}$ $\left(\text{or } 2\frac{1}{3}\right)$

25. $-1\frac{5}{8}+\frac{4}{8}$

$-\frac{13}{8}+\frac{4}{8} = \boxed{-\frac{9}{8}}$

$\left(\text{or } -1\frac{1}{8}\right)$

26. $-\frac{5}{6}+\left(-1\frac{1}{6}\right)$

$-\frac{5}{6}-\frac{7}{6} = -\frac{12}{6}$

$= \boxed{-2}$

27. $-3\frac{3}{4}-\left(-2\frac{1}{4}\right)$

$-\frac{15}{4}+\frac{9}{4}\Big) = -\frac{6}{4} = \boxed{-\frac{3}{2}}$

$\left(\text{or } -1\frac{1}{2}\right)$

Applications

28. Amaya is making bracelets. She has a piece of string that is $12\frac{1}{4}$ inches long. She cuts off a piece that is $8\frac{3}{4}$ inches. How much string does she have left? $12\frac{1}{4} - 8\frac{3}{4} = \frac{49}{4} - \frac{35}{4}$

$= \frac{14}{4} = \frac{7}{2}$ $\boxed{3\frac{1}{2} \text{ in}}$

29. Marcus is skiing. He is $860\frac{1}{10}$ feet up the mountain. He descends to $450\frac{7}{10}$ feet. What is his change in elevation?

$860\frac{1}{10} - 450\frac{7}{10} = \frac{8601}{10} - \frac{4507}{10} = \frac{4094}{10} = 409\frac{4}{10}$

$\boxed{409\frac{2}{5} \text{ ft}}$

30. Bill has $23\frac{4}{5}$ gallons of water in his aquarium. He adds $18\frac{3}{5}$ more gallons. How much water is in his aquarium?

$23\frac{4}{5} + 18\frac{3}{5} = \frac{119}{5} + \frac{93}{5} = \frac{212}{5} = \boxed{42\frac{2}{5} \text{ gal}}$

HW 5

Name:	Date:
Topic:	Class:

Least Common Multiple (LCM)

In order to add or subtract fractions with unlike bases, you need to find the **least common multiple** of the denonimators.

Practice: Find the LCM of each pair of numbers.

1. 2 and 8 — 8	2. 3 and 5 — 15	3. 8 and 10 — 40
3. 4 and 9 — 36	4. 6 and 21 — 42	6. 9 and 15 — 45

Adding & Subtracting Fractions

1. Write all mixed numbers as improper fractions.
2. Determine the LCM of the denominators.
3. Rewrite the fractions using the LCM as the denominator. Adjust each numerator to reflect the change in the denominator.
4. Add/Subtract the numerators and keep the common denominator.
5. Simplify (if needed).

Examples

Directions: Find each sum or difference. Write your answer in simplest form.

7. $\frac{11}{9}+\frac{2}{3} = \frac{11}{9}+\frac{6}{9}$

$= \boxed{\frac{17}{9}}$ (or $1\frac{8}{9}$)

8. $\frac{3}{4}+\frac{9}{7} = \frac{21}{28}+\frac{36}{28}$

$= \boxed{\frac{57}{28}}$ (or $2\frac{1}{28}$)

9. $-\frac{5}{6}+\frac{3}{8} = \frac{-20}{24}+\frac{9}{24}$

$= \boxed{\frac{-11}{24}}$

10. $-12+\frac{7}{5} = \frac{-60}{5}+\frac{7}{5}$

$= \boxed{\frac{-53}{5}}$ (or $-10\frac{3}{5}$)

11. $2\frac{2}{3}+6\frac{1}{8} = \frac{8}{3}+\frac{49}{8}$

$= \frac{64}{24}+\frac{147}{24}$

$= \boxed{\frac{211}{24}}$ (or $8\frac{19}{24}$)

12. $5\frac{1}{8}-\left(-1\frac{1}{20}\right) = \frac{41}{8}-\left(-\frac{21}{20}\right)$

$= \frac{205}{40}+\frac{42}{40}$

$= \boxed{\frac{247}{40}}$ (or $6\frac{7}{40}$)

13. $12\frac{1}{4} - 5\frac{2}{5} = \frac{49}{4} - \frac{27}{5}$

$= \frac{245}{20} - \frac{108}{20}$

$= \boxed{\frac{137}{20}}$ (or $6\frac{17}{20}$)

14. $\frac{5}{4} - \left(-\frac{11}{12}\right) = \frac{15}{12} + \frac{11}{12}$

$= \frac{26}{12}$

$= \boxed{\frac{13}{6}}$ (or $2\frac{1}{6}$)

15. $-5 - 2\frac{1}{3} = -5 - \frac{7}{3}$

$= \frac{-15}{3} - \frac{7}{3}$

$= \boxed{\frac{-22}{3}}$ (or $-7\frac{1}{3}$)

16. $1\frac{1}{4} + \left(-3\frac{1}{6}\right) = \frac{5}{4} + \left(-\frac{19}{6}\right)$

$= \frac{15}{12} - \frac{38}{12}$

$= \boxed{\frac{-23}{12}}$ (or $-1\frac{11}{12}$)

17. $3\frac{1}{3} + \left(-1\frac{1}{2}\right) = \frac{10}{3} + \left(-\frac{3}{2}\right)$

$= \frac{20}{6} - \frac{9}{6}$

$= \boxed{\frac{11}{6}}$ (or $1\frac{5}{6}$)

18. $18\frac{1}{8} - 4\frac{3}{5} = \frac{145}{8} - \frac{23}{5}$

$= \frac{725}{40} - \frac{184}{40}$

$= \boxed{\frac{541}{40}}$ (or $13\frac{21}{40}$)

Applications

19. Margie had $4\frac{2}{5}$ pans of lasagna. After a party she has $1\frac{1}{2}$ pans left. How much lasagna was eaten at the party?

$4\frac{2}{5} - 1\frac{1}{2} = \frac{22}{5} - \frac{3}{2}$

$= \frac{44}{10} - \frac{15}{10}$

$= \frac{29}{10} = \boxed{2\frac{9}{10} \text{ pans}}$

20. Brett ran $3\frac{1}{2}$ miles on Tuesday, $2\frac{1}{3}$ miles on Wednesday and $5\frac{3}{4}$ miles on Thursday. How many miles did he run altogether?

$3\frac{1}{2} + 2\frac{1}{3} + 5\frac{3}{4} = \frac{7}{2} + \frac{7}{3} + \frac{23}{4}$

$= \frac{42}{12} + \frac{28}{12} + \frac{69}{12}$

$= \frac{139}{12} = \boxed{11\frac{7}{12} \text{ mi}}$

21. What is the difference in height between a rose bush that is 3'9" tall and Emma who is $5\frac{1}{2}$ feet tall?

$5\frac{1}{2} - 3\frac{3}{4} = \frac{11}{2} - \frac{15}{4}$

$= \frac{22}{4} - \frac{15}{4}$

$= \frac{7}{4} = \boxed{1\frac{3}{4} \text{ ft}}$

22. An empty fish tank weighs $4\frac{2}{3}$ pounds. Once filled with water it weighs $29\frac{1}{4}$ pounds. How much water was added?

$29\frac{1}{4} - 4\frac{2}{3} = \frac{117}{4} - \frac{14}{3}$

$= \frac{351}{12} - \frac{56}{12}$

$= \frac{295}{12} = \boxed{24\frac{7}{12} \text{ lb}}$

HW 6

Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples
Multiplying Fractions	1 Write all mixed numbers as improper fractions.
	2 Simplify up and down and along the diagonals (if possible).
	3 Multiply the numerators to get the new numerator. Multiply the denominators to get the new denominator.
	4 Simplify (if needed).

Examples

1. $2 \times -\frac{7}{9} = \frac{2}{1} \cdot \frac{-7}{9}$

$= \boxed{\frac{-14}{9}} \left(-1\frac{5}{9}\right)$

2. $1\frac{1}{7} \times \frac{1}{10} = \frac{8}{7} \cdot \frac{1}{10}$

$= \frac{4}{7} \cdot \frac{1}{5}$

$= \boxed{\frac{4}{35}}$

3. $-1\frac{2}{3} \times -1\frac{2}{3} = \frac{-5}{3} \cdot \frac{-5}{3}$

$= \boxed{\frac{25}{9}} \left(2\frac{7}{9}\right)$

4. $2\frac{1}{2} \cdot 1\frac{1}{2} = \frac{5}{2} \cdot \frac{3}{2}$

$= \boxed{\frac{15}{4}} \left(3\frac{3}{4}\right)$

5. $-3\frac{1}{7} \cdot \frac{3}{4} = \frac{-22}{7} \cdot \frac{3}{4}$

$= \frac{-11}{7} \cdot \frac{3}{2}$

$= \frac{-33}{14} = -2\frac{5}{14}$

6. $-2 \times 1\frac{3}{4} = \frac{-2}{1} \cdot \frac{7}{4}$

$= \frac{-1}{1} \cdot \frac{7}{2}$

$= \boxed{\frac{-7}{2}} \left(-3\frac{1}{2}\right)$

7. $2\frac{1}{4} \cdot 2\frac{2}{3} \quad \frac{9}{4} \cdot \frac{8}{3}$

$\frac{3}{1} \cdot \frac{2}{1}$

$= \frac{6}{1} = \boxed{6}$

8. $-\frac{1}{2} \times 1\frac{4}{5} = \frac{-1}{2} \cdot \frac{9}{5}$

$= \boxed{\frac{-9}{10}}$

9. $-2\frac{1}{3} \cdot \frac{8}{3} = \frac{-7}{3} \cdot \frac{8}{3}$

$= \boxed{\frac{-56}{9}} \left(-6\frac{2}{9}\right)$

10. $-2\frac{4}{9} \cdot -1\frac{9}{10}$

$= \frac{-22}{9} \cdot \frac{-19}{10}$

$= \frac{-11}{9} \cdot \frac{-19}{5}$

$= \boxed{\frac{209}{45}} \left(4\frac{29}{45}\right)$

11. $\frac{5}{6} \cdot 2\frac{2}{5} = \frac{5}{6} \cdot \frac{12}{5}$

$= \frac{1}{1} \cdot \frac{2}{1}$

$= \frac{2}{1} = \boxed{2}$

12. $-1\frac{5}{9} \cdot -1\frac{7}{12}$

$= \frac{-14}{9} \cdot \frac{-19}{12}$

$= \frac{-7}{9} \cdot \frac{-19}{6}$

$= \boxed{\frac{133}{54}} \left(2\frac{25}{54}\right)$

Applications

13. Nikki just exercised for 180 minutes. Three-fifths of those minutes were spent running. How many minutes did she spend running?

$180 \cdot \frac{3}{5} = \frac{180}{1} \cdot \frac{3}{5}$

$= \frac{36}{1} \cdot \frac{3}{1}$

$= \boxed{108 \text{ min}}$

14. One batch of cookies requires $2\frac{2}{3}$ cups of sugar. How much sugar does Angela need if she wants to make $1\frac{1}{2}$ batches?

$2\frac{2}{3} \cdot 1\frac{1}{2} = \frac{8}{3} \cdot \frac{3}{2}$

$= \frac{4}{1} \cdot \frac{1}{1}$

$= \boxed{4 \text{ cups}}$

15. When she got in her car to drive to work, Mia had $11\frac{1}{2}$ gallons of gas in her tank. If she used $\frac{1}{8}$ of the gas in her tank to get to work, how much gas does she have left?

$11\frac{1}{2} \cdot \frac{1}{8} = \frac{23}{2} \cdot \frac{1}{8} = \frac{23}{16} = 1\frac{7}{16}$

$11\frac{1}{2} - 1\frac{7}{16} = \frac{23}{2} - \frac{23}{16}$

$= \frac{184}{16} - \frac{23}{16}$

$= \frac{161}{16} = \boxed{10\frac{1}{16} \text{ gal}}$

16. What is the area of a triangle that has a base of 8 inches and a height of $3\frac{2}{5}$ inches?

$A = \frac{1}{2} \cdot 8 \cdot 3\frac{2}{5}$

$= \frac{1}{2} \cdot \frac{8}{1} \cdot \frac{17}{5}$

$= \frac{1}{1} \cdot \frac{4}{1} \cdot \frac{17}{5}$

$= \frac{68}{5}$

$= \boxed{13\frac{3}{5} \text{ in}^2}$

HW 7

Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples
Dividing Fractions	1 Write all mixed numbers as improper fractions.
	2 Change the division symbol to multiplication and FLIP the second fraction to its reciprocal (KISS!)
	3 Multiply the numerators to get the new numerator. Multiply the denominators to get the new denominator.
	4 Simplify (if needed).

Examples

1. $-3 \div -\frac{1}{4} = \frac{-3}{1} \cdot -\frac{4}{1}$

$= \boxed{12}$

2. $\frac{8}{5} \div 2\frac{2}{3} = \frac{8}{5} \div \frac{8}{3}$

$= \frac{8}{5} \cdot \frac{3}{8}$

$= \boxed{\frac{3}{5}}$

3. $1\frac{1}{7} \div -\frac{1}{4} = \frac{8}{7} \div -\frac{1}{4}$

$= \frac{8}{7} \cdot \frac{-4}{1}$

$= \boxed{\frac{-32}{7}}$ $\left(-4\frac{4}{7}\right)$

4. $12 \div 1\frac{1}{2} = \frac{12}{1} \div \frac{3}{2}$

$= \frac{12}{1} \cdot \frac{2}{3}$

$= \boxed{8}$

5. $3\frac{1}{3} \div \frac{4}{21} = \frac{10}{3} \div \frac{4}{21}$

$= \frac{10}{3} \cdot \frac{21}{4}$

$= \boxed{\frac{35}{2}}$ $\left(17\frac{1}{2}\right)$

6. $8\frac{1}{4} \div 6 = \frac{33}{4} \div \frac{6}{1}$

$= \frac{33}{4} \cdot \frac{1}{6}$

$= \boxed{\frac{11}{8}}$ $\left(1\frac{3}{8}\right)$

7. $2\frac{1}{4} \div 1\frac{1}{6} = \frac{9}{4} \div \frac{7}{6}$

$= \frac{9}{4} \cdot \frac{6}{7}$

$= \boxed{\frac{27}{14}}$ $\left(1\frac{13}{14}\right)$

8. $-\frac{3}{4} \div 2\frac{2}{5} = -\frac{3}{4} \div \frac{12}{5}$

$= \frac{-3}{4} \cdot \frac{5}{12}$

$= \boxed{\frac{-5}{16}}$

9. $-3\frac{3}{7} \div \frac{6}{11} = \frac{-24}{7} \div \frac{6}{11}$

$= \frac{-24}{7} \cdot \frac{11}{6}$

$= \boxed{\frac{-44}{7}}$ $(-6\frac{2}{7})$

10. $7\frac{1}{7} \div 4 = \frac{50}{7} \div \frac{4}{1}$

$= \frac{50}{7} \cdot \frac{1}{4}$

$= \boxed{\frac{25}{14}}$ $(1\frac{11}{14})$

11. $-20 \div -\frac{5}{9} = \frac{-20}{1} \cdot -\frac{9}{5}$

$= \boxed{36}$

12. $10\frac{5}{6} \div \frac{5}{8} = \frac{65}{6} \div \frac{5}{8}$

$= \frac{65}{6} \cdot \frac{8}{5}$

$= \boxed{\frac{52}{3}}$ $(17\frac{1}{3})$

Applications

13. Bill has a ladder that is $8\frac{1}{2}$ feet tall. The ladder has 6 equal spaces between the rungs. How large is each space?

$8\frac{1}{2} \div 6 = \frac{17}{2} \cdot \frac{1}{6}$

$= \frac{17}{12} = \boxed{1\frac{5}{12} \text{ ft}}$ (1 ft, 5 in)

14. After a party in her class, Mrs. Jones has $3\frac{3}{5}$ pounds of fruit left. She splits the fruit into $\frac{2}{5}$ pound groups. How many groups will she have?

$3\frac{3}{5} \div \frac{2}{5} = \frac{18}{5} \cdot \frac{5}{2}$

$= \boxed{9 \text{ groups}}$

15. A group of friends are running a relay race that covers $3\frac{1}{2}$ miles. If each person runs $\frac{1}{4}$ mile, how many runners are there?

$3\frac{1}{2} \div \frac{1}{4} = \frac{7}{2} \cdot \frac{4}{1}$

$= \boxed{14 \text{ runners}}$

16. Fifteen songs that are all the same length are performed during a chorus concert. If the concert lasts 27 minutes and 30 seconds, how long is each song?

$27\frac{1}{2} \div 15 = \frac{55}{2} \cdot \frac{1}{15} = \frac{11}{6} = \boxed{1\frac{5}{6} \text{ min}}$

(1 min, 50 sec)

Summary: _____

HW 8

FRACTION OPERATIONS

ADDING & SUBTRACTING FRACTIONS

1. $3\frac{1}{2} - 4\frac{2}{5} = \frac{7}{2} - \frac{22}{5}$

$\frac{35}{10} - \frac{44}{10}$

$\boxed{\frac{-9}{10}}$

2. $4\frac{1}{7} + \left(-2\frac{1}{3}\right) = \frac{29}{7} + \left(-\frac{7}{3}\right)$

$\frac{87}{21} - \frac{49}{21}$

$= \boxed{\frac{38}{21}} \left(1\frac{17}{21}\right)$

3. $-1\frac{1}{2} - 2\frac{4}{7} = \frac{-3}{2} - \frac{18}{7}$

$\frac{-21}{14} - \frac{36}{14}$

$= \boxed{\frac{-57}{14}} \left(-4\frac{1}{14}\right)$

4. $3\frac{4}{5} - 2\frac{5}{6} = \frac{19}{5} - \frac{17}{6}$

$= \frac{114}{30} - \frac{85}{30}$

$= \boxed{\frac{29}{30}}$

3. $4\frac{5}{8} - 1\frac{2}{5} = \frac{37}{8} - \frac{7}{5}$

$= \frac{185}{40} - \frac{56}{40}$

$= \boxed{\frac{129}{40}} \left(3\frac{9}{40}\right)$

6. $\frac{5}{6} + 4\frac{7}{8} = \frac{5}{6} + \frac{39}{8}$

$= \frac{20}{24} + \frac{117}{24}$

$= \boxed{\frac{137}{24}} \left(5\frac{17}{24}\right)$

MULTIPLYING & DIVIDING FRACTIONS

7. $4\frac{1}{8} \cdot -2\frac{1}{3} = \frac{33}{8} \cdot \frac{-7}{3}$

$= \frac{11}{8} \cdot \frac{-7}{1}$

$= \boxed{\frac{-77}{8}} \left(-9\frac{5}{8}\right)$

8. $\frac{2}{7} \div \frac{4}{3} = \frac{2}{7} \cdot \frac{3}{4}$

$= \frac{1}{7} \cdot \frac{3}{2}$

$= \boxed{\frac{3}{14}}$

9. $-1\frac{1}{10} \div -\frac{11}{10} = \frac{-11}{10} \div \frac{-11}{10}$

$= \frac{-11}{10} \cdot \frac{-10}{11}$

$= \frac{-1}{1} \cdot \frac{-1}{1}$

$= \boxed{1}$

10. $-2\frac{5}{9} \times 1\frac{1}{8} = \frac{-23}{9} \cdot \frac{9}{8}$

$= \frac{-23}{1} \cdot \frac{1}{8}$

$= \boxed{\frac{-23}{8}} \left(-2\frac{7}{8}\right)$

11. $2 \div 3\frac{4}{9} = \frac{2}{1} \div \frac{31}{9}$

$= \frac{2}{1} \cdot \frac{9}{31}$

$= \boxed{\frac{18}{31}}$

12. $-3\frac{5}{9} \times \frac{1}{6} = \frac{-32}{9} \cdot \frac{1}{6}$

$= \frac{-16}{9} \cdot \frac{1}{3}$

$= \boxed{\frac{-16}{27}}$

APPLICATIONS

13. Nick was scuba diving at $-32\frac{1}{2}$ feet. If he descends another $8\frac{3}{5}$ feet, what is his location?

$-32\frac{1}{2} - 8\frac{3}{5} = \frac{-65}{2} - \frac{43}{5}$

$= \frac{-325}{10} - \frac{86}{10}$

$= \frac{-411}{10} = \boxed{-41\frac{1}{10}\text{ ft}}$

14. Melanie is going remove a $6\frac{1}{2}$ inch section from a piece of yarn that is $15\frac{3}{4}$ inches long. How much yarn is left?

$15\frac{3}{4} - 6\frac{1}{2} = \frac{63}{4} - \frac{13}{2}$

$= \frac{63}{4} - \frac{26}{4}$

$= \frac{37}{4} = \boxed{9\frac{1}{4}\text{ in}}$

15. Caroline's baby sister sleeps $\frac{5}{8}$ of the day. How many hours does she sleep?

$24 \cdot \frac{5}{8} = \frac{24}{1} \cdot \frac{5}{8}$

$= \frac{3}{1} \cdot \frac{5}{1}$

$= \boxed{15\text{hrs}}$

16. Lucy brought $2\frac{3}{4}$ batches of cookies to share with her coworkers. By the end of the day $\frac{5}{6}$ had been eaten. How much of the cookies are left?

$2\frac{3}{4} \cdot \frac{5}{6} = \frac{11}{4} \cdot \frac{5}{6} = \frac{55}{24} = 2\frac{7}{24}$

$2\frac{3}{4} - 2\frac{7}{24} = \frac{11}{4} - \frac{55}{24} = \frac{66}{24} - \frac{55}{24}$

$= \boxed{\frac{11}{24}\text{ batch left}}$

17. Josiah is building a birdhouse and has a piece of wood that is 18 feet long. He needs $1\frac{7}{8}$ foot long pieces. How many smaller pieces can he cut?

$18 \div 1\frac{7}{8} = \frac{18}{1} \div \frac{15}{8}$

$= \frac{18}{1} \cdot \frac{8}{15}$

$= \frac{6}{1} \cdot \frac{8}{5} = \frac{48}{5} = \boxed{9\frac{3}{5}\text{ pieces}}$

18. A square has a side length of $5\frac{1}{4}$ inches. What is the area of the square? $(A = s \cdot s)$

$5\frac{1}{4} \cdot 5\frac{1}{4} = \frac{21}{4} \cdot \frac{21}{4}$

$= \frac{441}{16}$

$= \boxed{27\frac{9}{16}\text{ inches}^2}$

19. Kevin and Justin wanted to see who could run the furthest in 10 minutes. Kevin ran $1\frac{5}{6}$ miles and Justin ran $1\frac{2}{5}$ miles. How much further did Kevin run?

$1\frac{5}{6} - 1\frac{2}{5} = \frac{11}{6} - \frac{7}{5}$

$= \frac{55}{30} - \frac{42}{30}$

$= \boxed{\frac{13}{30}\text{ miles}}$

20. Melissa practiced piano for $\frac{5}{6}$ of an hour on Monday and $\frac{8}{9}$ of an hour on Tuesday. How many more minutes did she practice on Tuesday compared to Monday?

$\frac{8}{9} - \frac{5}{6} = \frac{16}{18} - \frac{15}{18}$

$= \frac{1}{18}\text{ hours}$

$\frac{1}{18} \cdot \frac{60}{1} = \frac{1}{3} \cdot \frac{10}{1} = \frac{10}{3} = \boxed{3\frac{1}{3}\text{ minutes}}$

HW 9

Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples

Converting Fractions, Decimals, & Percents

Fraction	Decimal	Percent
$\frac{3}{5}$	0.6	60%
$\frac{9}{50}$	0.18	18%

- Fraction → Decimal: Divide the numerator by the denominator.
- Decimal → Percent: Move the decimal to the RIGHT two places.
- Percent → Decimal: Move the decimal to the LEFT two places.
- Decimal → Fraction: READ IT, WRITE IT, REDUCE IT!

Examples

Complete the chart below.

	Fraction	Decimal	Percent
1.	$\frac{2}{25}$	0.08	8%
2.	$\frac{6}{25}$	0.24	24%
3.	$\frac{7}{12}$	≈ 0.5833	58.33%
4.	$\frac{9}{200}$	0.045	4.5%
5.	$\frac{7}{10}$	0.7	70%
6.	$\frac{5}{6}$	≈ 0.8333	83.33%
7.	$\frac{14}{25}$	0.56	56%
8.	$\frac{63}{125}$	0.504	50.4%
9.	$\frac{2}{3}$	≈ 0.6667	66.67%
10.	$\frac{3}{25}$	0.12	12%

Decimal Operations
Review

Adding Decimals:
Line up the decimals and add a placeholder if necessary. Add.

Subtracting Decimals:
Line up the decimals and add a placeholder if necessary. Subtract.

Multiplying Decimals
Multiply as if there is no decimal. Move the decimal in your answer the same number of places as the sum of the number of decimal places in the problem.

Dividing Decimals

- **Whole Number Divisor :** Divide as if there is no decimal. "Float" the decimal up into the answer.
- **Decimal Divisor :** Move the decimal to the right until the divisor is a whole number. Move the decimal in the dividend the same number of places right. Divide as if there is no decimal. "Float" the decimal up into the answer.

Examples

11. $1.9 + 6.82$

$$\begin{array}{r} 1.90 \\ +\ 6.82 \\ \hline \boxed{8.72} \end{array}$$

12. $5.29 + 4.9$

$$\begin{array}{r} 5.29 \\ +\ 4.90 \\ \hline \boxed{10.19} \end{array}$$

13. $2.45 - 0.8$

$$\begin{array}{r} 2.45 \\ -\ 0.80 \\ \hline \boxed{1.65} \end{array}$$

14. $12.3 - 6.63$

$$\begin{array}{r} 12.30 \\ -\ 6.63 \\ \hline \boxed{5.67} \end{array}$$

15. $5.27(9)$

$$\begin{array}{r} 527 \\ \times\ \ 9 \\ \hline 4743 \\ \downarrow \\ \boxed{47.43} \end{array}$$

16. 6.2×1.4

$$\begin{array}{r} 62 \\ \times\ 14 \\ \hline 868 \\ \downarrow \\ \boxed{8.68} \end{array}$$

17. $4.7 \div 2$

$$2\overline{)4.70} \quad 2.35$$

$$\begin{array}{r} -4 \\ \hline 07 \\ -06 \\ \hline 10 \\ -10 \\ \hline 0 \end{array}$$

18. $3 \div 0.6$

$$0.6\overline{)3.0} \quad \boxed{5}$$

$$6\overline{)30}$$

$$\begin{array}{r} -30 \\ \hline 0 \end{array}$$

HW 10

Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples
Solving Problems with Mixed Forms	To solve problems involving a mix of fractions, decimals and percents: ➢ Convert one (or more) numbers in the problem so all numbers in the problem are in the same format. ➢ Add, subtract, multiply and/or divide using the rules for fraction or decimal operations.

Examples

Directions: Evaluate each expression. **Give your final answer as a fraction in simplest form.**

1. $\frac{2}{3} \times 0.4 = \frac{2}{3} \cdot \frac{2}{5} = \boxed{\frac{4}{15}}$

2. $\frac{7}{10} - 0.25 = \frac{7}{10} - \frac{1}{4} = \frac{14}{20} - \frac{5}{20} = \boxed{\frac{9}{20}}$

3. $0.95 \div \frac{2}{3} = \frac{19}{20} \div \frac{2}{3} = \frac{19}{20} \cdot \frac{3}{2} = \boxed{\frac{57}{40}} \left(1\frac{17}{40}\right)$

4. $-\frac{2}{5} \div 0.2 = \frac{-2}{5} \div \frac{1}{5} = \frac{-2}{5} \cdot \frac{5}{1} = \boxed{-2}$

5. $0.9 - \left(-\frac{11}{12}\right) = \frac{9}{10} + \frac{11}{12} = \frac{54}{60} + \frac{55}{60} = \boxed{\frac{109}{60}} \left(1\frac{49}{60}\right)$

6. $-\frac{1}{4} \cdot -0.3 = \frac{-1}{4} \cdot \frac{-3}{10} = \boxed{\frac{3}{40}}$

Directions: Evaluate each expression. **Give your final answer as a decimal.**

7. $-1\frac{2}{5} \times 0.3 = -1.4 \times 0.3 \rightarrow -14 \times 3 = -42$ $\boxed{-0.42}$

8. $-0.25 + 2\frac{1}{5} = -0.25 + 2.20 = \boxed{1.95}$

9. $0.6 \div 1\frac{1}{2} = 0.6 \div 1.5$

$15\overline{)6.0}$ $\quad -60$ $\quad 0$ $\quad .4$ $\quad \boxed{0.4}$

10. $-\frac{1}{2} \div 0.5 = -0.5 \div 0.5$

$5\overline{)-5}$ $\quad -5$ $\quad 0$ $\quad 1$ $\quad \boxed{-1}$

11. $-1.5 - \left(-2\frac{3}{5}\right) = -1.5 + 2.6 = \boxed{1.1}$

12. $-\frac{5}{6} \cdot 0.3$

$-\frac{5}{6} \cdot \frac{3}{10} = \frac{-1}{2} \cdot \frac{1}{2} = -\frac{1}{4}$ $\quad \boxed{-.25}$

Applications

13. Nancy rode her bike for $15\frac{4}{5}$ miles on Saturday. On Sunday, she rode 0.7 fewer miles. How many miles did she ride on Sunday?

$15\frac{4}{5} - \frac{7}{10} = \frac{79}{5} - \frac{7}{10}$

$= \frac{158}{10} - \frac{7}{10}$

$= \frac{151}{10} =$ $15\frac{1}{10}$ mi (15.1 mi)

14. Ryan bought $4\frac{2}{3}$ pounds of apples for \$0.75 per pound. How much did he pay for the apples?

$4\frac{2}{3} \cdot \frac{3}{4} = \frac{14}{3} \cdot \frac{3}{4}$

$= \frac{7}{2}$

\$3.50

15. Cameron is 48.6 inches tall and Kellen is $50\frac{1}{4}$ inches tall. How much taller is Kellen?

50.25
- 48.60

1.65 in

16. Heather and Marcus are training for a marathon. Heather ran 48.6 miles last week. Marcus completed 90% as many miles as Heather. How many miles did Marcus run?

48.6 x .9

486
x 9
4374 → 43.74 mi

17. Brielle spent \$4.90 for $3\frac{1}{2}$ pounds of ham. What is the cost per pound?

4.90 ÷ 3.5

$35\overline{)49.0}$ → 1.4

-35
140
-140
0

\$1.40/lb

18. Byron bought 1.9 pounds of bananas and $\frac{11}{12}$ pound of grapes. How many more pounds of bananas did he buy?

$1\frac{9}{10} - \frac{11}{12} = \frac{19}{10} - \frac{11}{12}$

$= \frac{114}{60} - \frac{55}{60}$

$= \frac{59}{60}$ lb

19. The average test score in Mrs. Jones' math class was 82.5. The average score in Mr. Myles' class was 70% of Mrs. Jones' test average. What was the average score in Mr. Myles' class?

82.5
x 0.7 → 825 x 7 = 5775

57.75%

20. A 6% sales tax is charged on a \$43.50 item. How much is paid for the item altogehter?

43.50
x .06 → 4350 x 6 = 26100

\$2.61 (tax)

43.50
+ 2.61
46.11

\$46.11

HW 11

Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples
Exponents	In the case of repeated multiplication with the same number, we can rewrite the expression using **exponents.** For example: $2 \cdot 2 \cdot 2 = 2^3$ **Parts of an exponential expression:** base → x^n ← exponent **Read as:** x to the nth power

Examples

	Expanded Notation	Exponential Expression	Value
1.	$6 \cdot 6 \cdot 6 \cdot 6 \cdot 6$	6^5	7,776
2.	$23 \cdot 23$	23^2	529
3.	$(-3) \cdot (-3) \cdot (-3) \cdot (-3)$	$(-3)^4$	81
4.	$11 \cdot 11 \cdot 11$	11^3	1,331
5.	$(-4) \cdot (-4) \cdot (-4) \cdot (-4)$	$(-4)^4$	256
6.	$2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$	2^7	128
7.	$\frac{4}{9} \cdot \frac{4}{9}$	$\left(\frac{4}{9}\right)^2$	$\frac{16}{81}$
8.	$\frac{1}{3} \cdot \frac{1}{3} \cdot \frac{1}{3} \cdot \frac{1}{3}$	$\left(\frac{1}{3}\right)^4$	$\frac{1}{81}$
9.	$(-10) \cdot (-10)$	$(-10)^2$	100
10.	$a \cdot a \cdot a \cdot a \cdot a \cdot a \cdot a$	a^7	a^7
11.	$\frac{1}{x} \cdot \frac{1}{x} \cdot \frac{1}{x} \cdot \frac{1}{x}$	$\left(\frac{1}{x}\right)^4$	$\frac{1}{x^4}$
12.	$m \cdot m \cdot n \cdot n \cdot n$	$m^2 \cdot n^2$	m^2n^2
13.	$r \cdot p \cdot p \cdot r \cdot r \cdot p \cdot r \cdot r \cdot r$	$p^3 \cdot r^6$	p^3r^6
14.	$c \cdot c \cdot d \cdot c \cdot c \cdot d \cdot d \cdot d \cdot d$	$c^4 \cdot d^5$	c^4d^5

Perfect Squares

The square of an integer is called a perfect square.

Generate the first 10 perfect squares below:

1^2	2^2	3^2	4^2	5^2	6^2	7^2	8^2	9^2	10^2
1	4	9	16	25	36	49	64	81	100

Square Roots

- The opposite of squaring a number is finding the square root.
- The **radical sign**, $\sqrt{x}$, is used to indicate the square root of x.

Examples

15. Circle each value that is a perfect square.

(16) 20 (441) (81) (225) 290 (25) 500 (900)

Directions : Find each square root.

16. $\sqrt{4}$ 2	**17.** $\sqrt{361}$ 19	**18.** $\sqrt{169}$ 13
19. $\sqrt{625}$ 25	**20.** $\sqrt{289}$ 17	**21.** $\sqrt{1600}$ 40

Directions : Estimate each square root to the nearest tenth.

22. $\sqrt{90} \approx 9.5$	**23.** $\sqrt{53} \approx 7.3$	**24.** $\sqrt{148} \approx 12.2$
25. $\sqrt{264} \approx 16.2$	**26.** $\sqrt{12} \approx 3.5$	**27.** $\sqrt{195} \approx 14.0$

28. The area of a square is 64 square inches. What is the length of one side?

$A = s^2$

$\sqrt{64} = \sqrt{s^2}$

$\boxed{8 \text{ in}} = s$

29. Dan built a square patio with an area of 80 square feet. Estimate the length of each side of the patio to the nearest tenth.

$A = s^2$

$\sqrt{80} = \sqrt{s^2}$

$\boxed{8.9 \text{ ft}} \approx s$

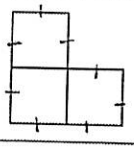
30. Greg and Jax each have square shaped rooms. The area of Greg's room is 144 square feet and the area of Jax's room is 196 square feet. How much longer is each side of Jax's room?

G: $\sqrt{144} = \sqrt{s^2}$ $12 = s$

J: $\sqrt{196} = \sqrt{s^2}$ $14 = s$

$\boxed{2 \text{ feet}}$

31. Nick's garden is broken into three sections, each with an area of 256 square feet. He wants to put a fence around the perimeter of the entire garden. How much fencing will he need?



$\sqrt{256} = \sqrt{s^2}$

$16 = s$

$16(8) = \boxed{128 \text{ ft}}$

HW 12

Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples

POWERS OF 10

Complete the table below to show the powers of 10.

POSITIVE POWERS

Power	Expanded Form	Value
10^5	$10 \cdot 10 \cdot 10 \cdot 10 \cdot 10$	100,000
10^4	$10 \cdot 10 \cdot 10 \cdot 10$	10,000
10^3	$10 \cdot 10 \cdot 10$	1,000
10^2	$10 \cdot 10$	100
10^1	10	10
10^0	(special case!)	1

Negative powers of 10 can be written as fractions:

$10^{-n} =$

NEGATIVE POWERS

Power	Fractional Form	Decimal Form
10^{-1}	$\frac{1}{10}$	0.1
10^{-2}	$\frac{1}{10^2} = \frac{1}{10 \cdot 10} = \frac{1}{100}$	0.01
10^{-3}	$\frac{1}{10^3} = \frac{1}{10 \cdot 10 \cdot 10} = \frac{1}{1000}$	0.001
10^{-4}	$\frac{1}{10^4} = \frac{1}{10 \cdot 10 \cdot 10 \cdot 10} = \frac{1}{10000}$	0.0001
10^{-5}	$\frac{1}{10^5} = \frac{1}{10 \cdot 10 \cdot 10 \cdot 10 \cdot 10} = \frac{1}{100000}$	0.00001

SCIENTIFIC NOTATION

- Scientific notation is a Compact way of writing very small or very large numbers using the powers of 10.
- A number written in scientific notation has the form $a \times 10^n$ where $1 \leq a < 10$.

Scientific Notation to Standard Form.

Converting scientific notation to standard form is easy! The exponent tells you the directions AND the number of places to move the decimal.

Directions: Write each number in standard form.

	Scientific Notation	Standard Form
1.	4.3×10^2	430
2.	2.19×10^7	21,900,000

	3.	5×10^{4}	50,000
	4.	7.2×10^{-1}	0.72
	5.	3×10^{-6}	0.000003
	6.	8.52×10^{-3}	0.00852

Standard Form to Scientific Notation

Step 1: Move to decimal so the new number is between 1 and a number up to 10.

Step 2: Write using a power of ten. The exponent matches the number of times the decimal was moved.

- If the decimal was moved left, the exponent is positive.
- If the decimal was moved right, the exponent is negative.

	Scientific Notation	Standard Form
7.	9×10^{5}	900,000
8.	2.4×10^{3}	2,400
9.	1.65×10^{8}	165,000,000
10.	4×10^{-2}	0.04
11.	6.8×10^{-7}	0.00000068
12.	5.51×10^{-4}	0.000551

COMPARING VALUES

Directions: Place a <, > or = in the circle to complete each statement.

13. 8×10^{5} (>) 1×10^{4}	14. 5.52×10^{2} (<) 9.4×10^{3}
15. 7.54×10^{-2} (<) 4.73×10^{-1}	16. 9.89×10^{-9} (<) 3.14×10^{-5}
17. 240,000 (>) 1.7×10^{4}	18. 8×10^{4} (<) 800000
19. 5.2×10^{-8} (=) 0.000000052	20. 0.0009 (<) 7.5×10^{-3}