<table>
<tr><td>Teacher:</td><td>Day: 6</td><td>Date:</td></tr>
<tr><td>Course: ACT Prep Math</td><td colspan="2">Class Period:</td></tr>
<tr><td>Unit: Integrating Essential Skills</td><td colspan="2">Topic:Mean, Median, Mode</td></tr>
<tr><td>Objective:
The student will be able to determine the mean, median, and mode given a data set. The student will also be able to use the center measures to determine components of the data set.</td><td colspan="2">I Can Statement:
I can determine the mean, median, and mode of a given data set. I can use the mean, median, and mode to determine components of the data set.</td></tr>
<tr><td colspan="3">Procedure:
1. Students work Bell Ringer - Day 6 (5-10 minutes).
2. Present students with opening activity, “What’s Your Age?”. Discuss and compare the values calculated by some of the students. (10-15 minutes)
3. Day 6 Slides - Students complete Guided Notes (20 minutes). Optional Video
4. Students complete Day 6 - Practice questions (15-20 minutes). Provide answers and be prepared to answer any questions related to practice questions. Optional Video
5. With 5 minutes remaining, provide Day 6 - Exit Ticket for students to complete.
6. Remind students to complete any unfinished questions for homework. (5-A-Day questions optional per teacher.)</td></tr>
<tr><td colspan="3">Materials:
Day 6 - Bell Ringer
“What’s Your Age?” Worksheet
Day 6 - Review Slides (Google)
Day 6 - Guided Notes
Day 6 - Practice (PDF or Google Forms)
Day 6 - Exit Ticket
5-A-Day Worksheet (optional)
Video of Review Slides
Video of Practice Questions</td></tr>
<tr><td colspan="3">Accommodations/Special Circumstances:</td></tr>
<tr><td colspan="3">Technology:
Computer/Google to present slides</td></tr>
<tr><td>Reflection:</td><td colspan="2">Extra/Additional Resources:</td></tr>
</table>

Name: _____Period: _____ Date: _____

Bell Ringer Day 6

1. Place in decreasing order: -2, 4, -1.5, -2.2, 1, 1.15, -1.47

2. -14 + 22 =

3. Solve: (2 - 5) + 3(12/6 - 1)

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Name: _____Period: _____ Date: _____

ANSWERS - Bell Ringer Day 6

1. Place in decreasing order: -2, 4, -1.5, -2.2, 1, 1.15, -1.47

   4, 1.15, 1, -1.47, -1.5, -2, -2.2

2. -14 + 22 = 8

3. Solve: (2 - 5) + 3(12/6 - 1)

   (-3) + 3(2 - 1) = (-3) + 3(1) = -3 + 3 = 0

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Bell Ringer Activity

1. Place in decreasing order: -2, 4, -1.5, -2.2, 1, 1.15, -1.47

2. -14 + 22 =

3. Solve: (2 - 5) + 3(12/6 - 1)

Bell Ringer Answers

1. Place in decreasing order: -2, 4, -1.5, -2.2, 1, 1.15, -1.47

   4, 1.15, 1, -1.47, -1.5, -2, -2.2

2. -14 + 22 = 8

3. Solve: (2 - 5) + 3(12/6 - 1)

   (-3) + 3(2 - 1) = (-3) + 3(1) = -3 + 3 = 0

Math ACT Prep

Day 6 - IES: Mean, Median, and Mode

Mean

- **Mean** is the sum of the data items divided by the number of data items.
- The word *average* indicates arithmetic mean. *(from the directions on the ACT math section)*
- Example: Given the data set 9.7, 8.3, 8.8, 10.2, 9.4, find the mean.

9.7 + 8.3 + 8.8 + 10.2 + 9.4 = **46.4**

46.4 / 5 = **9.28**

Median

- **Median** is the middle value in the data set.
- Order the numbers in the data set. *(Can order least to greatest or greatest to least.)*
  - If the number of data items is odd, the median is just the middle value
  - If the number of data items is even, the median is the mean of the two middle numbers.
- Example 1: Using the same data set (9.7, 8.3, 8.8, 10.2, 9.4), find the median.

8.3, 8.8, 9.4, 9.7, 10.2

Odd → Middle number 

- Example 2: Using the data set, 3.1, 4.4, 5.2, 3.6, find the median.

3.1, 3.6, 4.4, 5.2

Even → Mean of 2 Middle Numbers: (3.6 + 4.4)/2 = **4**

Mode

- **Mode** is the data value(s) that occur most often.
- Example: Find the mode in the data set 10, 12, 9, 12, 11, 8, 6, 12

12 occurs 3 times, all other values occur once → 12

ACT-Type Example

Matt has the following grades in his science class: 92, 85, 96, and 100. If he has one more test to take in the class, what must he make to finish the grading period with an average of 90?

A. 77
B. 79
C. 90
D. 93

92
85
96
+100
373 ⇨ Sum of 4 grades

To make a 90 average with 5 grades…

(500)(.90) = 450
- 373
77

Day 6 Guided Notes - IES: Mean, Median, Mode

Mean:

- _____ is the sum of the data items divided by the number of data items.
- The word *average* indicates arithmetic mean. *(from the directions on the ACT math section)*
- Example: Given the data set 9.7, 8.3, 8.8, 10.2, 9.4, find the mean.

9.7 + 8.3 + 8.8 + 10.2 + 9.4 = _____

_____ / 5 = _____

Median:

- _____ is the middle value in the data set.
- Order the numbers in the data set. *(Can order least to greatest or greatest to least.)*
  - If the number of data items is odd, the median is just the _____
  - If the number of data items is even, the median is the _____ of the two middle numbers.
- Example 1: Using the same data set (9.7, 8.3, 8.8, 10.2, 9.4), find the median.
- Example 2: Using the data set, 3.1, 4.4, 5.2, 3.6, find the median.

Mode:

- _____ is the data value(s) that occur most often.
- Example: Find the mode in the data set 10, 12, 9, 12, 11, 8, 6, 12

ACT-Type Example:

Matt has the following grades in his science class: 92, 85, 96, and 100. If he has one more test to take in the class, what must he make to finish the grading period with an average of 90?

A. 77
B. 79
C. 90
D. 93

Day 6 - Practice Questions

Mean, Median, Mode

1. If the amounts of rainfall in an area over a month are 1.7”, 2.2”, 0.5”, 0.72”, and 1.1”, what is the mean amount of rainfall in the area for the month?

   A. 1.1”
   B. 1.2”
   C. 1.3”
   D. 1.6”

2. If the mean of 6 numbers increased by 3, by how much would the sum of the 6 numbers have to increase?

   F. 3
   G. 6
   H. 12
   J. 18

3. If the mean of 5 numbers is 36, what is the 5th number if four of the numbers are 27, 42, 43, and 35?

   A. 33
   B. 36
   C. 36.8
   D. 38

4. What is the median of the following 9 numbers: 23, 15, 32, 27, 19, 11, 30, 19, 22?

   F. 19
   G. 21.3
   H. 22
   J. 23

Use the following table with the last 2 questions.

Julie asked 15 people how many times a week they eat out for supper. The responses are summarized below. (Responses were given in intervals. For example, 3 people responded that they eat out 0-1 times a week.)

Number of Times Eat Out in a Week	Number of Responses
0 - 1	3
2 - 3	7
4 - 5	4
6 - 7	1

5. Which interval contains the median of the data?

   A. 0-1
   B. 2-3
   C. 4-5
   D. Cannot determine from this information

6. Which interval contains the mode of the data?

   E. 0 - 1
   F. 2 - 3
   G. 4 - 5
   J. Cannot determine from this information

Day 6 - Practice Questions - ANSWERS Key

Mean, Median, Mode

1. **B** - If the amounts of rainfall in an area over a month are 1.7", 2.2", 0.5", 0.72", and 1.1", what is the mean amount of rainfall in the area for the month?

   A. 1.1"
   B. 1.2" ←
   C. 1.3"
   D. 1.6"

   $1.7+2.2+.5+.72+1.1=6.22$

   $\frac{6.22}{5}=1.244\rightarrow 1.2$

2. **J** - If the mean of 6 numbers increased by 3, by how much would the sum of the 6 numbers have to increase?

   F. 3
   G. 6
   H. 12
   J. 18 ←

   $m_1 \rightarrow m_1+3=m_2$

   $m_1=\frac{s_1}{6}$ $m_2=\frac{s_2}{6}=m_1+\frac{3}{6}$

   By Example: $10\rightarrow 13$ $10=\frac{s_1}{6}$ $13=\frac{s_2}{6}\Rightarrow s_2=96$

   $s_1=60$ $96-78=18$

3. **A** - If the mean of 5 numbers is 36, what is the 5th number if four of the numbers are 27, 42, 43, and 35?

   A. 33 ←
   B. 36
   C. 36.8
   D. 38

   $36=\frac{\text{sum}}{5}$

   $180=\text{sum}$ (36×5)

   $27+42+43+35=147$

   $180-147=33$

4. **H** - What is the median of the following 9 numbers: 23, 15, 32, 27, 19, 11, 30, 19, 22?

   F. 19
   G. 21.3
   H. 22 ←
   J. 23

   ↳ 5th position

   11, 15, 19, 19, 22, 23, 27, 30, 32

   1 2 3 4 5

Use the following table with the last 2 questions.

Julie asked 15 people how many times a week they eat out for supper. The responses are summarized below. (Responses were given in intervals. For example, 3 people responded that they eat out 0-1 times a week.)

Number of Times Eat Out in a Week	Number of Responses
0 - 1	3
2 - 3	7
4 - 5	4
6 - 7	1

3 + 10 ← 8th person in this interval

5. **B** - Which interval contains the median of the data?

15 people → 8th position

A. 0 - 1
B. 2 - 3 ←
C. 4 - 5
D. Cannot determine from this information

6. **G** - Which interval contains the mode of the data?

most often ⇒ 7 in 2-3 interval

F. 0 - 1
G. 2 - 3 ←
H. 4 - 5
J. Cannot determine from this information

What's Your Age?

Name: _____

Choose 5 fellow students and record their ages in months in the chart below. Include your age as well, and calculate the values requested.

Student	Age (in months)
1	
2	
3	
4	
5	
Self	
Sum of Ages	
Mean Age	
Median Age	
Mode Age	

Calculations:

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Name: _____Period: _____ Date: _____

Exit Ticket Day 6

Find the mean, median, and mode of the following data set: 3.2, 2.7, 4.1, 1.9, 2.4, 3.2

Mean:

Median:

Mode:

Name: _____Period: _____ Date: _____

ANSWERS - Exit Ticket Day 6

Find the mean, median, and mode of the following data set: 3.2, 2.7, 4.1, 1.9, 2.4, 3.2

Mean: (3.2+2.7+4.1+1.9+2.4+3.2)/6 = 17.5/ 6 = 2.9

Median: 2.95

Mode: 3.2

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<tr><td>Teacher:</td><td>Day: 7</td><td>Date:</td></tr>
<tr><td>Course: ACT Prep Math</td><td colspan="2">Class Period:</td></tr>
<tr><td>Unit: Integrating Essential Skills</td><td colspan="2">Topic: Factors, Least Common Multiple</td></tr>
<tr><td>Objective:
The student will be able to determine the factors of a number and determine the least common multiple of a set of numbers.</td><td colspan="2">I Can Statement:
I can determine the factors of a number and determine the least common multiple of a set of numbers.</td></tr>
<tr><td colspan="3">Procedure:
1. Students work Bell Ringer - Day 7 (5-10 minutes).
2. Day 7 Slides - Students complete Guided Notes (20 minutes). Optional Video
3. Students complete Day 7 - Practice questions (15-20 minutes). Provide answers and be prepared to answer any questions related to practice questions. Optional Video
4. Pair students to work “4 In a Row - LCM” activity. (10-15 minutes)
5. With 5 minutes remaining, provide Day 7 - Exit Ticket for students to complete.
6. Remind students to complete any unfinished questions for homework. (5-A-Day questions optional per teacher.)</td></tr>
<tr><td colspan="3">Materials:
Day 7 - Bell Ringer
Day 7 - Review Slides (Google)
Day 7 - Guided Notes
Day 7 - Practice (PDF or Google Forms)
Video of Practice Questions
“4 In a Row - LCM” Worksheet
Day 7 - Exit Ticket
5-A-Day Worksheet (optional)
Video of Review Slides</td></tr>
<tr><td colspan="3">Accommodations/Special Circumstances:</td></tr>
<tr><td colspan="3">Technology:
Computer/Google to present slides</td></tr>
<tr><td>Reflection:</td><td colspan="2">Extra/Additional Resources:
Dice (2) for each student pair (activity)</td></tr>
</table>

Name: _____Period: _____ Date: _____

Bell Ringer Day 7

1. -58 - (-42) =

2. $-\frac{1}{6} - \frac{2}{3} =$

3. $5\ \frac{3}{10} - 1\ \frac{31}{50} =$

4. -47(-29) =

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Name: _____Period: _____ Date: _____

ANSWERS - Bell Ringer Day 7

1. -58 - (-42) = -16

2. $-\frac{1}{6} - \frac{2}{3} = -\frac{5}{6}$

3. $5\frac{3}{10} - 1\frac{31}{50} = \frac{184}{50} = 3\frac{17}{25}$

4. -47(-29) = 1363

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Bell Ringer Activity

1. -58 - (-42) =

2. $-\frac{1}{6} - \frac{2}{3} =$

3. $5\ \frac{3}{10} - 1\ \frac{31}{50} =$

4. -47(-29) =

Bell Ringer Answers

ANSWERS - Bell Ringer Day 7

1. -58 - (-42) = -16

2. $-\frac{1}{6} - \frac{2}{3} = -\frac{5}{6}$

3. $5\frac{3}{10} - 1\frac{31}{50} = \frac{184}{50} = 3\frac{17}{25}$

4. -47(-29) = 1363

Math ACT Prep

Day 7 - IES: Factors and Least Common Multiple

Factors

- The **factors** of a number (or expression) are the numbers (or expressions) you **multiply** together to get the number.
- We are usually concerned with finding the whole-number factors (positive or negative) unless specified otherwise.
- Examples:
  - Find the factors of 12

    12: 1, 2, 3, 4, 6, 12 → The numbers that divide evenly into 12
  - Find the factors of 36

    36: 1, 2, 3, 4, 6, 9, 12, 18, 36 → The numbers that divide evenly into 36

Least Common Multiple

- The least common multiple is the **smallest** positive number that is a **multiple** of two or more numbers.
- A multiple of a number results from multiplying that number with another number.
- The multiples of 3 are 3, 6, 9, 12, 15, … (multiply 3 by 1, 2, 3, 4, 5, …)
- Example:

  Find the least common multiple of 6 and 8.

  6: 6, 12, 18, 24, 30, … (let's try some of the multiples of 8 now)

  8: 8, 16, 24 → 24 is a multiple of both, the least common multiple of 6 and 8

ACT-Type Example

What is the least common multiple of 12, 15, and 20?

A. 20
B. 30
C. 60
D. 120

12: 12, 24, 36, 48, 60, …
15: 15, 30, 45, 60, …
20: 20, 40, 60

Day 7 Guided Notes - IES: Factors and Least Common Multiple

Factors:

- The _____ of a number (or expression) are the numbers (or expressions) you _____ together to get the number.
- We are usually concerned with finding the whole-number factors (positive or negative) unless specified otherwise.
- Examples:
  - Find the factors of 12

    12: The numbers that divide evenly into 12
  - Find the factors of 36

    36: The numbers that divide evenly into 36

Least Common Multiple:

- The least common multiple is the _____ positive number that is a _____ of two or more numbers.
- A multiple of a number results from multiplying that number with another number.
- The multiples of 3 are 3, 6, 9, 12, 15, … (multiply 3 by 1, 2, 3, 4, 5, …)
- Example:

  Find the least common multiple of 6 and 8.

  6: (let's try some of the multiples of 8 now)

  8: _____ is a multiple of both, the least common multiple of 6 and 8

ACT-Type Example:

What is the least common multiple of 12, 15, and 20?

A. 20
B. 30
C. 60
D. 120

Day 7 - Practice Questions

Factors

1. Which of the following lists all the positive factors of 10?

   A. 1, 10
   B. 2, 4, 5
   C. 10, 20, 30
   D. 1, 2, 5, 10

2. For all positive integers *x*, what is the greatest common factor of the two numbers 128*x* and 240x?

   F. 4
   G. x
   H. 16x
   J. 64x

Least Common Multiple

3. What is the least common multiple of 20, 30, and 40?

   A. 20
   B. 30
   C. 120
   D. 1200

4. Jan is having either 6, 8, or 12 classmates (counting herself) over to prepare for a class skit. If her mother is preparing snacks and wants to have an equal number of slices of pizza for each classmate, what is the minimum number of slices she should have to ensure that everyone gets the same number of slices with no leftovers?

   F. 12
   G. 16
   H. 24
   J. 36

5. Consider all positive integers that are multiples of 10 and are less than or equal to 200. What fraction of those integers are multiples of 15?

   A. $\frac{1}{20}$

   B. $\frac{3}{20}$

   C. $\frac{3}{10}$

   D. $\frac{2}{5}$

Day 7 - Practice Questions - ANSWERS Key

Factors

1. **D** - Which of the following lists all the positive factors of 10?

   A. 1, 10
   B. 2, 4, 5
   C. 10, 20, 30
   D. 1, 2, 5, 10 ←

   1, 2, 5, 10

2. **H** - For all positive integers *x*, what is the greatest common factor of the two numbers 128*x* and 240x?

   F. 4
   G. x
   H. 16x ←
   J. 64x

   128x : x (1, ... , 128)
   240x : x (1, ... , 240)
   OR
   * Look at answer choices (start w/ "greatest" (largest)) answer - 64x ✓ X ✓
   check 16x - x ✓ \ 64 X \ 16 ✓

Least Common Multiple

3. **C** - What is the least common multiple of 20, 30, and 40?

   A. 20
   B. 30
   C. 120 ←
   D. 1200

   20 : 20, 40, 60, ..., 120, ...
   30 : 30, 60, 90, 120, ...
   40 : 40, 80, 120, ...
   or check answer choices (least 1st)

4. **H** - Jan is having either 6, 8, or 12 classmates (counting herself) over to prepare for a class skit. If her mother is preparing snacks and wants to have an equal number of slices of pizza for each classmate, what is the minimum number of slices she should have to ensure that everyone gets the same number of slices with no leftovers?

   F. 12
   G. 16
   H. 24 ←
   J. 36

   LCM
   6 - 6, 12, 18, 24, ...
   8 - 8, 16, 24, ...
   12 - 12, 24, ...
   or check answer choices

5. **C** - Consider all positive integers that are multiples of 10 and are less than or equal to 200. What fraction of those integers are multiples of 15?

A. $\frac{1}{20}$

B. $\frac{3}{20}$

C. $\frac{3}{10}$ ←

D. $\frac{2}{5}$

10, 20, 30, 40, 50, 60, 70, 80, 90, 100
110, 120, ... 150 ..., 180, 190, 200

---

20 total numbers

$\frac{6}{20} = \frac{3}{10}$

multiples of 15: 15, 30, 45, 60, 75, 90,
105, 120, 135, 150, 165,
180, 195

1
6

4 In a Row - Least Common Multiple

Players: _____

On each turn, a player rolls 2 dice. Then, the player finds the least common multiple (LCM) of the two numbers rolled. Player shades with his/her color the LCM on the game board. Get 4 shaded LCM's in a row to WIN!

Note: If a player rolls numbers with the LCM not available on the game board, play swaps to the next player.

Game 1

6	30	2	1	15
10	3	12	20	4
5	20	4	6	3
12	1	15	5	12
3	6	2	30	10

Game 2

15	30	10	6	5
2	3	5	1	30
12	6	12	20	3
4	20	3	15	1
6	12	10	4	2

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Name: _____Period: _____ Date: _____

Exit Ticket Day 7

What is the least common multiple of 6, 8, and 9?

Name: _____Period: _____ Date: _____

ANSWERS - Exit Ticket Day 7

What is the least common multiple of 6, 8, and 9?

6: 6, 12, 18, 24, 30, 36, 42, 48, 54, 60, 66, 72

8: 8, 16, 24, 32, 40, 48, 56, 64, 72

9: 9, 18, 27, 36, 45, 54, 63, 72

72

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<tr><td>Course: ACT Prep Math</td><td colspan="2">Class Period:</td></tr>
<tr><td>Unit: Integrating Essential Skills</td><td colspan="2">Topic: Fractions, Reciprocals</td></tr>
<tr><td>Objective:
The student will be able to compare fractions, perform calculations with fractions, and recognize reciprocals.</td><td colspan="2">I Can Statement:
I can compare fractions, perform calculations with fractions, and recognize reciprocals.</td></tr>
<tr><td colspan="3">Procedure:
1. Students work Bell Ringer - Day 8 (5-10 minutes).
2. Day 8 Slides - Students complete Guided Notes (20 minutes). Optional Video
3. Students complete Day 8 - Practice questions (15 minutes). Provide answers and be prepared to answer any questions related to practice questions. Optional Video
4. Play “Matho-Fractions and Reciprocals”. (10-15 minutes)
5. With 5 minutes remaining, provide Day 8 - Exit Ticket for students to complete.
6. Remind students to complete any unfinished questions for homework. (5-A-Day questions optional per teacher.)</td></tr>
<tr><td colspan="3">Materials:
Day 8 - Bell Ringer
Day 8 - Review Slides (Google)
Day 8 - Guided Notes
Day 8 - Practice (PDF or Google Forms)
“Matho-Fractions and Reciprocals” Cards
“Matho-Fractions and Reciprocals” Game Cards
5-A-Day Worksheet (optional)
Video of Review Slides
Day 8 - Exit Ticket
Video of Practice Questions</td></tr>
<tr><td colspan="3">Accommodations/Special Circumstances:</td></tr>
<tr><td colspan="3">Technology:
Computer/Google to present slides</td></tr>
<tr><td>Reflection:</td><td colspan="2">Extra/Additional Resources:
Chips or scrap paper (matho game)</td></tr>
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Name: _____Period: _____ Date: _____

Bell Ringer Day 8

1. -12(15) =

2. $(-1\frac{4}{5})(-2\frac{1}{2})$ =

3. $\frac{3}{5}$(-5)(-2) =

4. -64 ÷ (-8) =

5. -23.94 ÷ 10.5 =

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Name: _____Period: _____ Date: _____

ANSWERS - Bell Ringer Day 8

1. -12(15) = -180

2. $(-1\frac{4}{5})(-2\frac{1}{2})$ = $(-\frac{9}{5})(-\frac{5}{2})$ = $\frac{45}{10}$ = $4\frac{1}{2}$

3. $\frac{3}{5}$(-5)(-2) = $\frac{30}{5}$ = 6

4. -64 ÷ (-8) = 8

5. -23.94 ÷ 10.5 = -2.28

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Bell Ringer Activity

1. -12(15) =

2. $(-1\frac{4}{5})(-2\frac{1}{2})$ =

3. $\frac{3}{5}(-5)(-2)$ =

4. -64 ÷ (-8) =

5. -23.94 ÷ 10.5 =

Bell Ringer Answers

1. $-12(15) = -180$

2. $(-1\frac{4}{5})(-2\frac{1}{2}) = (-\frac{9}{5})(-\frac{5}{2}) = \frac{45}{10} = 4\frac{1}{2}$

3. $\frac{3}{5}(-5)(-2) = \frac{30}{5} = 6$

4. $-64 \div (-8) = 8$

5. $-23.94 \div 10.5 = -2.28$

Math ACT Prep

Day 8 - IES: Fractions and Reciprocals

Fractions

- A fraction can be thought of as the **part** over the **whole**.
- The number above the fraction bar is the **numerator**.
- The number below the fraction bar is the **denominator**.
- To compare fractions with different denominators, you must find a **common** denominator.

Fractions

- Common ACT-type questions include…
  - Ordering fractions
    Compare using a common denominator (if necessary)
  - Adding/Subtracting fractions
    Get a common denominator, then add/subtract the numerators
  - Multiplying fractions
    Multiply the numerators, then multiply the denominators
  - Dividing fractions
    Flip the numerator and denominator of the 2nd fraction and multiply

Reciprocals

- The reciprocal of a number is the **inverse** of a number.
- Every number has a reciprocal except for 0 (1/0 is undefined...you cannot have 0 as a denominator).
- The reciprocal of a whole number is 1 divided by the whole number.

  Example: 5 → reciprocal is ⅕
- For the reciprocal of a fraction, **swap** the numerator and the denominator.

  Example: ⅔ → reciprocal is 3/2

ACT-Type Example

When 7⅔ is written as an improper fraction in lowest terms, the numerator of the fraction is:

A. 6
B. 14
C. 21
D. 23

7 ⅔ ⇒ (3 x 7) + 2 =23
23/3

Day 8 Guided Notes - IES: Fractions and Reciprocals

Fractions:

- A fraction can be thought of as the _____ over the _____.
- The number above the fraction bar is the _____.
- The number below the fraction bar is the _____.
- To compare fractions with different denominators, you must find a _____ denominator.
- Common ACT-type questions include…
    - Ordering fractions
        Compare using a common denominator (if necessary)
    - Adding/Subtracting fractions
        Get a common denominator, then add/subtract the numerators
    - Multiplying fractions
        Multiply the numerators, then multiply the denominators
    - Dividing fractions
        Flip the numerator and denominator of the 2nd fraction and multiply

Reciprocals:

- The reciprocal of a number is the _____ of a number.
- Every number has a reciprocal except for 0 (1/0 is undefined...you cannot have 0 as a denominator).
- The reciprocal of a whole number is 1 divided by the whole number.

    Example: 5 → reciprocal is _____

- For the reciprocal of a fraction, _____ the numerator and the denominator.

    Example: ⅔ → reciprocal is _____

ACT-Type Example:

When 7⅔ is written as an improper fraction in lowest terms, the numerator of the fraction is:

A. 6
B. 14
C. 21
D. 23

MATHO - Fractions and Reciprocals

Each player gets a MATHO card and chips or paper scraps to cover spaces as the game begins. Game cards have been separated and turned face down. The game host randomly chooses a card and calls out the expression on the card.

Play continues in the manner of a traditional BINGO game. Players check their game card for the answer to the expression and cover the space if on their card. When a player covers 5 spaces in a row (vertical, horizontal, or diagonal), the player says "Matho!". Host confirms the covered spaces are correct.

Suggestion: Players will most likely need a scratch sheet of paper to use to calculate the expressions called. Included are 20 different MATHO cards. Laminate these cards or run off on heavy cardstock for longer life.

$\frac{1}{2}+\frac{1}{2}$ (1)	Reciprocal of ⅔ (3/2)
$\frac{1}{3}+\frac{1}{3}$ (⅔)	Reciprocal of -3 (-⅓)
$\frac{1}{6}+\frac{1}{3}$ (½)	Reciprocal of -⅔ (-3/2)
$\frac{2}{7}+\frac{5}{14}$ (9/14)	Reciprocal of $\frac{1}{4}$ (4)

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$\frac{3}{4} - \frac{1}{2}$ (¼)	Reciprocal of -12 (-1/12)
$\frac{2}{3} - \frac{7}{12}$ (1/12)	Reciprocal of $\frac{4}{9}$ (9/4)
$\frac{7}{15} - \frac{1}{3}$ (2/15)	Which one is greater: ⅕ or ⅓ ? (⅓)
$\frac{9}{14} - \frac{2}{7}$ (5/14)	Which one is greater: $\frac{5}{12}$ or $\frac{5}{11}$? (5/11)
Which one is smaller: $\frac{5}{12}$ or $\frac{5}{11}$? (5/12)	Which one is greater: $\frac{6}{13}$ or $\frac{7}{13}$? (7/13)
Which one is smaller: $\frac{3}{10}$ or $\frac{7}{10}$? (3/10)	Which one is smaller: $\frac{3}{5}$ or $\frac{3}{8}$? (⅜)
$\frac{2}{3} \times \frac{6}{10}$ (⅖)	$\frac{2}{21} \times \frac{7}{12}$ (1/18)

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$\frac{1}{15} \times \frac{5}{7}$ (1/21)	$\frac{7}{4} \times \frac{28}{14}$ (7/2)
$\frac{9}{2} \times \frac{4}{3}$ (6)	$\frac{3}{25} \times \frac{5}{9}$ (1/15)
$\frac{2}{3} \div \frac{6}{10}$ (10/9)	$\frac{2}{6} \div \frac{7}{12}$ (4/7)
$\frac{1}{14} \div \frac{5}{7}$ (1/10)	$\frac{6}{4} \div \frac{14}{28}$ (3)
$\frac{9}{2} \div \frac{4}{3}$ (27/8)	$\frac{2}{3} \div \frac{5}{9}$ (6/5)

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M	A	T	H	O
$\frac{9}{14}$	4	6	$\frac{10}{9}$	$\frac{4}{7}$
$-\frac{3}{2}$	$\frac{1}{21}$	$\frac{7}{2}$	$\frac{1}{15}$	$\frac{5}{12}$
$\frac{2}{5}$	$\frac{1}{18}$	FREE	$\frac{5}{14}$	$\frac{5}{11}$
$\frac{3}{8}$	$\frac{1}{12}$	$\frac{2}{15}$	$\frac{1}{3}$	$\frac{27}{8}$
$\frac{1}{4}$	$-\frac{1}{12}$	$\frac{9}{4}$	$\frac{1}{10}$	3

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M	A	T	H	O
$\frac{7}{13}$	$\frac{3}{2}$	$\frac{3}{8}$	$\frac{4}{7}$	$\frac{2}{5}$
$\frac{6}{5}$	$\frac{1}{2}$	3	6	$\frac{1}{18}$
1	$-\frac{1}{3}$	FREE	$\frac{1}{15}$	$\frac{5}{12}$
$\frac{2}{3}$	$\frac{3}{10}$	$\frac{10}{9}$	$\frac{1}{21}$	$\frac{5}{14}$
$\frac{9}{14}$	$-\frac{3}{2}$	4	$\frac{7}{2}$	$\frac{1}{3}$

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M	A	T	H	O
$\frac{3}{10}$	$\frac{1}{10}$	$\frac{1}{15}$	1	$\frac{1}{12}$
$\frac{2}{5}$	$\frac{27}{8}$	$\frac{4}{7}$	$\frac{2}{3}$	$\frac{2}{15}$
$\frac{1}{21}$	$\frac{3}{8}$	FREE	$\frac{1}{2}$	$\frac{5}{14}$
6	$\frac{1}{18}$	3	$\frac{9}{14}$	$\frac{5}{12}$
$\frac{10}{9}$	$\frac{7}{2}$	$\frac{6}{5}$	$\frac{1}{4}$	4

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M	A	T	H	O
$\frac{1}{4}$	$-\frac{1}{12}$	$\frac{10}{9}$	$\frac{4}{7}$	3
$\frac{1}{3}$	$\frac{2}{15}$	$\frac{1}{12}$	$\frac{9}{4}$	$\frac{1}{10}$
$\frac{27}{8}$	$\frac{6}{5}$	FREE	$\frac{5}{14}$	$\frac{5}{11}$
$\frac{3}{10}$	$\frac{3}{2}$	1	$\frac{7}{13}$	$\frac{5}{12}$
$\frac{3}{8}$	$\frac{1}{18}$	$\frac{2}{5}$	$-\frac{1}{3}$	$\frac{2}{3}$

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M	A	T	H	O
6	$-\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{4}$	4
$-\frac{3}{2}$	$\frac{2}{5}$	$\frac{3}{8}$	$\frac{1}{18}$	$\frac{1}{21}$
$\frac{9}{14}$	$\frac{1}{2}$	FREE	$-\frac{1}{3}$	$\frac{3}{10}$
$\frac{5}{12}$	$\frac{7}{13}$	1	$\frac{2}{3}$	$\frac{3}{2}$
$\frac{5}{11}$	$\frac{27}{8}$	$\frac{6}{5}$	3	$\frac{1}{10}$

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M	A	T	H	O
$\frac{4}{7}$	6	$\frac{6}{5}$	$\frac{7}{13}$	4
$\frac{2}{5}$	$\frac{7}{2}$	$\frac{3}{10}$	$\frac{3}{2}$	$\frac{5}{12}$
$\frac{5}{14}$	$\frac{2}{3}$	FREE	$\frac{1}{21}$	$\frac{1}{18}$
$-\frac{1}{3}$	3	$\frac{9}{14}$	$\frac{1}{15}$	1
$\frac{10}{9}$	$\frac{1}{3}$	$\frac{3}{8}$	$\frac{1}{2}$	$-\frac{3}{2}$

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M	A	T	H	O
$\frac{3}{8}$	$\frac{10}{9}$	$-\frac{1}{12}$	$\frac{2}{5}$	$\frac{1}{18}$
$\frac{3}{10}$	$\frac{4}{7}$	$\frac{1}{4}$	$-\frac{1}{3}$	$\frac{9}{14}$
$\frac{3}{2}$	$\frac{7}{2}$	FREE	$\frac{2}{3}$	4
1	$\frac{1}{21}$	$\frac{5}{14}$	$\frac{7}{13}$	6
$\frac{1}{2}$	$-\frac{3}{2}$	$\frac{5}{11}$	$\frac{5}{12}$	$\frac{1}{15}$

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M	A	T	H	O
$\frac{5}{12}$	$\frac{5}{14}$	$\frac{2}{15}$	$\frac{1}{12}$	$\frac{1}{4}$
$\frac{3}{2}$	1	$\frac{2}{3}$	$\frac{1}{2}$	$\frac{9}{14}$
$-\frac{1}{3}$	$-\frac{3}{2}$	FREE	4	$-\frac{1}{12}$
$\frac{27}{8}$	$\frac{7}{13}$	$\frac{5}{11}$	$\frac{1}{3}$	$\frac{9}{4}$
$\frac{1}{10}$	$\frac{10}{9}$	6	$\frac{1}{21}$	$\frac{2}{5}$

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M	A	T	H	O
$-\frac{3}{2}$	$\frac{1}{18}$	$\frac{3}{8}$	$\frac{2}{5}$	$\frac{1}{21}$
6	$\frac{1}{4}$	$\frac{1}{12}$	$-\frac{1}{12}$	4
$\frac{9}{14}$	$-\frac{1}{3}$	FREE	$\frac{1}{2}$	$\frac{3}{10}$
$\frac{5}{12}$	$\frac{2}{3}$	1	$\frac{7}{13}$	$\frac{3}{2}$
$\frac{5}{11}$	3	$\frac{6}{5}$	$\frac{27}{8}$	$\frac{1}{10}$

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M	A	T	H	O
$\frac{1}{15}$	1	$-\frac{1}{3}$	$\frac{7}{13}$	4
$\frac{4}{7}$	6	$\frac{6}{5}$	$\frac{1}{21}$	$\frac{1}{18}$
$\frac{5}{14}$	$\frac{2}{3}$	FREE	3	$\frac{9}{14}$
$\frac{2}{5}$	$\frac{7}{2}$	$\frac{3}{10}$	$\frac{3}{2}$	$\frac{5}{12}$
$\frac{10}{9}$	$\frac{1}{3}$	$\frac{3}{8}$	$\frac{1}{2}$	$-\frac{3}{2}$

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M	A	T	H	O
$\frac{3}{8}$	3	$\frac{2}{15}$	$\frac{1}{3}$	$\frac{1}{18}$
$\frac{7}{2}$	$\frac{5}{11}$	$\frac{5}{12}$	$\frac{1}{15}$	$-\frac{3}{2}$
$\frac{2}{5}$	$\frac{27}{8}$	FREE	$\frac{5}{14}$	$\frac{1}{21}$
6	4	$\frac{4}{7}$	$\frac{10}{9}$	$\frac{9}{14}$
$\frac{1}{4}$	$-\frac{1}{12}$	$\frac{9}{4}$	$\frac{1}{10}$	$\frac{1}{12}$

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M	A	T	H	O
$\frac{2}{3}$	$\frac{1}{21}$	$\frac{10}{9}$	$-\frac{1}{3}$	$\frac{5}{14}$
$\frac{6}{5}$	6	3	$\frac{7}{2}$	$\frac{1}{18}$
$\frac{4}{7}$	$\frac{1}{15}$	FREE	$\frac{2}{5}$	$\frac{5}{12}$
$\frac{3}{2}$	$\frac{3}{10}$	1	$\frac{3}{8}$	$\frac{7}{13}$
$\frac{9}{14}$	$\frac{1}{2}$	4	$-\frac{3}{2}$	$\frac{1}{3}$

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M	A	T	H	O
$\frac{1}{21}$	$\frac{5}{12}$	$\frac{9}{4}$	$\frac{1}{10}$	3
$\frac{1}{4}$	$-\frac{1}{12}$	$\frac{3}{8}$	$\frac{1}{3}$	$\frac{2}{15}$
$\frac{2}{5}$	$\frac{5}{14}$	FREE	$\frac{1}{18}$	$\frac{5}{11}$
$\frac{1}{12}$	$\frac{27}{8}$	$-\frac{3}{2}$	$\frac{1}{15}$	$\frac{7}{2}$
$\frac{9}{14}$	4	6	$\frac{10}{9}$	$\frac{4}{7}$

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M	A	T	H	O
$\frac{1}{21}$	$\frac{5}{14}$	$\frac{3}{10}$	$\frac{9}{14}$	$-\frac{3}{2}$
$\frac{6}{5}$	$\frac{7}{13}$	$\frac{3}{2}$	6	$\frac{2}{5}$
1	$-\frac{1}{3}$	FREE	$\frac{1}{15}$	$\frac{5}{12}$
$\frac{2}{3}$	$\frac{1}{18}$	$\frac{10}{9}$	$\frac{4}{7}$	$\frac{3}{8}$
$\frac{1}{2}$	3	4	$\frac{7}{2}$	$\frac{1}{3}$

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M	A	T	H	O
$\frac{1}{4}$	$-\frac{1}{12}$	$\frac{9}{4}$	$\frac{1}{10}$	3
$-\frac{3}{2}$	$\frac{1}{15}$	$\frac{7}{2}$	$\frac{1}{21}$	$\frac{5}{12}$
$\frac{2}{5}$	$\frac{5}{14}$	FREE	$\frac{1}{18}$	$\frac{5}{11}$
$\frac{3}{8}$	$\frac{1}{3}$	$\frac{2}{15}$	$\frac{1}{12}$	$\frac{27}{8}$
$\frac{9}{14}$	4	6	$\frac{10}{9}$	$\frac{4}{7}$

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M	A	T	H	O
$\frac{2}{3}$	$\frac{5}{14}$	$\frac{10}{9}$	$\frac{1}{21}$	$\frac{3}{10}$
$\frac{6}{5}$	$\frac{1}{18}$	3	6	$\frac{1}{2}$
1	$\frac{5}{12}$	FREE	$\frac{1}{15}$	$-\frac{1}{3}$
$\frac{7}{13}$	$\frac{3}{8}$	$\frac{2}{5}$	$\frac{4}{7}$	$\frac{3}{2}$
$\frac{9}{14}$	$\frac{1}{3}$	4	$\frac{7}{2}$	$-\frac{3}{2}$

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M	A	T	H	O
$-\frac{3}{2}$	$\frac{5}{11}$	$\frac{5}{12}$	$\frac{1}{15}$	$\frac{9}{14}$
$\frac{3}{10}$	$\frac{4}{7}$	$\frac{1}{4}$	$-\frac{1}{3}$	4
$\frac{3}{2}$	$\frac{7}{2}$	FREE	$\frac{2}{3}$	6
1	$\frac{1}{21}$	$\frac{5}{14}$	$\frac{7}{13}$	$\frac{1}{18}$
$\frac{3}{8}$	$\frac{10}{9}$	$-\frac{1}{12}$	$\frac{2}{5}$	$\frac{1}{2}$

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M	A	T	H	O
$\frac{5}{11}$	$\frac{1}{21}$	4	$\frac{1}{12}$	$\frac{1}{4}$
6	1	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{5}{14}$
$\frac{9}{14}$	$-\frac{3}{2}$	FREE	$-\frac{1}{3}$	$\frac{10}{9}$
$-\frac{1}{12}$	$\frac{7}{13}$	$\frac{2}{15}$	$\frac{27}{8}$	$\frac{9}{4}$
$\frac{3}{2}$	$\frac{5}{12}$	$\frac{2}{3}$	$\frac{1}{10}$	$\frac{2}{5}$

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M	A	T	H	O
$\frac{6}{5}$	$\frac{27}{8}$	$\frac{1}{3}$	$\frac{2}{15}$	3
$-\frac{1}{12}$	$\frac{1}{4}$	$\frac{1}{12}$	$\frac{9}{4}$	$\frac{1}{10}$
$\frac{10}{9}$	$\frac{4}{7}$	FREE	$\frac{1}{15}$	6
$\frac{1}{21}$	$-\frac{3}{2}$	$\frac{1}{2}$	$\frac{9}{14}$	4
$\frac{7}{2}$	$\frac{1}{18}$	$\frac{2}{5}$	$-\frac{1}{3}$	$\frac{2}{3}$

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M	A	T	H	O
$\frac{1}{3}$	$\frac{27}{8}$	$\frac{6}{5}$	$\frac{5}{11}$	$\frac{5}{14}$
$\frac{2}{15}$	$\frac{1}{12}$	$\frac{1}{4}$	$-\frac{1}{12}$	$\frac{10}{9}$
$\frac{1}{21}$	$\frac{7}{2}$	FREE	$\frac{1}{15}$	$\frac{4}{7}$
$-\frac{3}{2}$	$\frac{1}{2}$	$\frac{2}{3}$	$-\frac{1}{3}$	$\frac{2}{5}$
1	$\frac{3}{2}$	$\frac{3}{10}$	$\frac{3}{8}$	$\frac{1}{18}$

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Day 8 - Practice Questions

Fractions

1. Arrange the following fractions in decreasing order: $\frac{5}{6}, \frac{1}{3}, \frac{7}{3}, \frac{5}{2}, \frac{5}{4}$.

   A. $\frac{7}{3} > \frac{5}{2} > \frac{5}{4} > \frac{1}{3} > \frac{5}{6}$
   B. $\frac{5}{2} > \frac{7}{3} > \frac{5}{4} > \frac{1}{3} > \frac{5}{6}$
   C. $\frac{5}{2} > \frac{7}{3} > \frac{5}{4} > \frac{5}{6} > \frac{1}{3}$
   D. $\frac{1}{3} > \frac{5}{6} > \frac{5}{4} > \frac{7}{3} > \frac{5}{2}$

2. A $250,000 house is assessed at ⅕ of its value. If the yearly tax rate is $3.20 per hundred of assessed value, what is the yearly tax on this property?

   F. $ 500
   G. $ 1,600
   H. $ 4,000
   J. $ 6,400

Reciprocals

3. Two numbers, x and y, are reciprocals. Which expression is always true?

   A. xy = 1
   B. x - y = 0
   C. $\frac{x}{y} = 1$
   D. x + y = -1

4. If a and b are reciprocals and 0 < a < 1, then b must be:

   F. Less than -1
   G. Between -1 and 0
   H. Between 0 and 1
   J. Greater than 1

Day 8 - Practice Questions - ANSWERS

Key

Fractions

1. **C** - Arrange the following fractions in decreasing order: $\frac{5}{6}, \frac{1}{3}, \frac{7}{3}, \frac{5}{2}, \frac{5}{4}$.

   ~~A.~~ $\frac{7}{3} > \frac{5}{2} > \frac{5}{4} > \frac{1}{3} > \frac{5}{6}$

   B. $\frac{5}{2} > \frac{7}{3} > \frac{5}{4} > \frac{1}{3} > \frac{5}{6}$

   (C.) $\frac{5}{2} > \frac{7}{3} > \frac{5}{4} > \frac{5}{6} > \frac{1}{3}$ ←

   ~~D.~~ $\frac{1}{3} > \frac{5}{6} > \frac{5}{4} > \frac{7}{3} > \frac{5}{2}$

   ① $\frac{5}{6} > \frac{1}{3}$; $\frac{5}{6} < \frac{7}{3}$; $\frac{7}{3} < \frac{5}{2}$

   ② Plug in calculator and order values

   ⊛ $\frac{5}{2} > \frac{5}{4}$ eliminate A & D

   *Looking at B & C, the difference is $\frac{1}{3}$ vs. $\frac{5}{6}$ $\quad \frac{1}{3} < \frac{5}{6} \Rightarrow$ C

2. **G** - A $250,000 house is assessed at ⅕ of its value. If the yearly tax rate is $3.20 per hundred of assessed value, what is the yearly tax on this property?

   F. $ 500

   (G.) $ 1,600 ←

   H. $ 4,000

   J. $ 6,400

   $250{,}000\left(\frac{1}{5}\right) = \frac{50{,}000}{100} = 500(3.20)$

   $= 1600$

Reciprocals

3. **A** - Two numbers, x and y, are reciprocals. Which expression is always true?

   (A.) xy = 1 ← $3\left(\frac{1}{3}\right) = 1$ ✓ └ Example: $x = 3$, $y = \frac{1}{3}$

   B. x - y = 0 $3 - \frac{1}{3} \neq 0$ ✗

   C. $\frac{x}{y} = 1$ $\frac{3}{\frac{1}{3}} = 3 \cdot 3 = 9$ ✗ → Evaluate w/ A–D

   D. x + y = -1 $3 + \frac{1}{3} \neq -1$

   * But can stop evaluating w/ A being true

4. **J** - If a and b are reciprocals and $0 < a < 1$, then b must be:

   F. Less than -1

   G. Between -1 and 0

   H. Between 0 and 1

   (J.) Greater than 1 ←

   ↳ fraction & positive

   Example: $a = \frac{1}{3} \rightarrow b = 3$

   So, b is positive and > 1

Name: _____Period: _____ Date: _____

Exit Ticket Day 8

If 8 hours in a day are spent working, what fraction of a 24-hour day is this, in lowest terms?

If on a Friday, 3 hours are spent working, what fraction of the day is this, in lowest terms?

For fun… Add these 2 fractions.

Name: _____Period: _____ Date: _____

ANSWERS - Exit Ticket Day 8

If 8 hours in a day are spent working, what fraction of a 24-hour day is this, in lowest terms?

$$\frac{8}{24} = \frac{1}{3}$$

If on a Friday, 3 hours are spent working, what fraction of the day is this, in lowest terms?

$$\frac{3}{24} = \frac{1}{8}$$

For fun… Add these 2 fractions. $\frac{1}{3} + \frac{1}{8} = \frac{8}{24} + \frac{3}{24} = \frac{11}{24}$