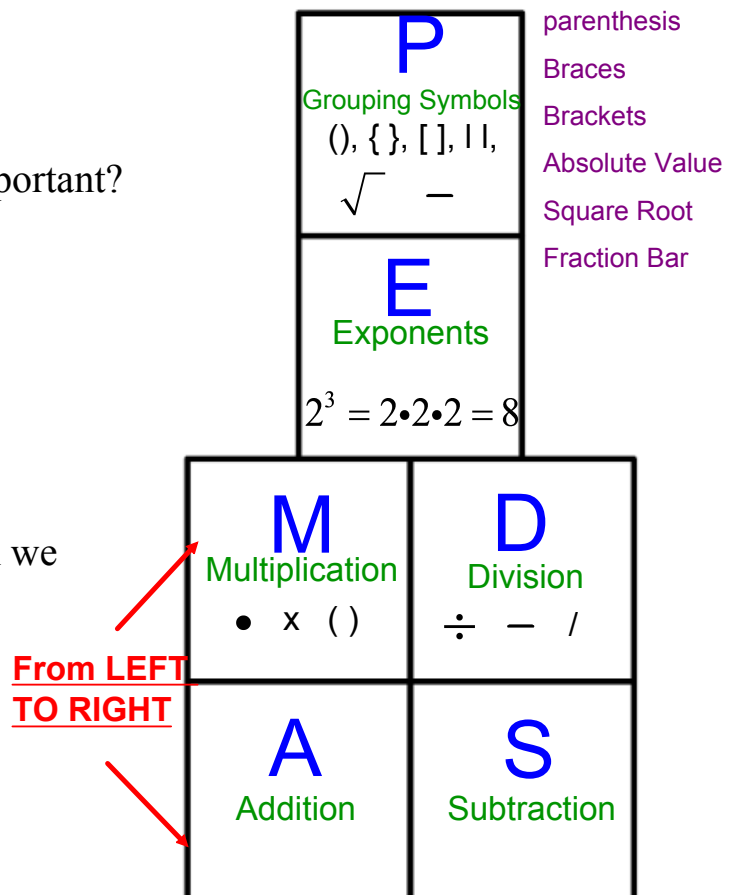


## Brainstorming September 24th

- What is the order of operations?
- Why do we have it/Why is it important?
- When do we use it?
- What are the steps?
- Are the steps any different when we have signed numbers?  
(negative and positives)



Integer Operations Review  
(with Order of Operations)

Name \_\_\_\_\_ Per. \_\_

**How do you solve problems with integers?**

⇒ **First**, you must identify which operation you need to do first.

⇒ **Then**, you need to think about which Integer Rules you need to use.

Here is a summary of the rules:

**Adding Integers:**

- Same Signs: **Add** the numbers together and **keep** the signs.
- Different Signs: **Subtract** the numbers; keep the bigger number's sign.

**Subtracting Integers:** Change the problem to "adding the opposite."

**Multiplying or Dividing Integers**

- Same Signs: Multiply/divide like normal. The answer will be **positive**.
- Different Signs: Multiply/divide like normal. The answer will be **negative**.

**Phase One: Integers**

- |   |  |                                     |   |
|---|--|-------------------------------------|---|
| 1. $21 - (-9) = \underline{30}$<br><small>21 + 9</small>  | 2. $-8 + (-10) = \underline{-18}$                          | 3. $8 \div (-2) = \underline{-4}$   | 4. $-5 \cdot -5 = \underline{25}$                         |
| 5. $24 + (-13) = \underline{11}$                          | 6. $-12 + (-12) = \underline{-24}$                         | 7. $7 \cdot (-2) = \underline{-14}$ | 8. $30 - (-5) = \underline{35}$                           |
| 9. $-27 \div (-9) = \underline{3}$                        | 10. $4 - 36 = \underline{-32}$<br><small>4 + (-36)</small> | 11. $-3 \cdot 8 = \underline{-24}$  | 12. $-50 \div 10 = \underline{-5}$                        |
| 13. $34 - (-4) = \underline{38}$<br><small>34 + 4</small> | 14. $-20 + -13 = \underline{-33}$                          | 15. $36 \div (-6) = \underline{-6}$ | 16. $-6 - (-4) = \underline{-2}$<br><small>-6 + 4</small> |

**Phase Two: Order of Operations with Integers**

- |  |   |   |
|--|---|---|
| 17. $5 + (-4) \cdot (-2) = \underline{13}$<br><small>5 + 8</small>     | 18. $-10 \div (-2) \cdot (-3) = \underline{-15}$<br><small>5 \cdot -3</small>                   | 19. $25 \div (-5) - (-10) = \underline{5}$<br><small>-5 + 10</small><br>turn sub to add: "add the opposite" |
| 20. $-18 + (-5) \cdot (-4) = \underline{2}$<br><small>-18 + 20</small> | 21. $8 - (-4) + (-10) = \underline{2}$<br><small>8 + 4 + -10</small><br><small>12 + -10</small> | 22. $-2 \cdot (-4) + (-4) \cdot 3 = \underline{-4}$<br><small>8 + -12</small>                               |

***Phase Three: Slightly Harder Order of Operations with Integers (box your answers)***

23.  $-4 \cdot (-4) \div (-8) - 2$

$$\begin{aligned} & 16 \div (-8) - 2 \\ & -2 - 2 = \boxed{-4} \end{aligned}$$

24.  $-6 + (-30) \div 5 - (-2)$

$$\begin{aligned} & -6 + -6 + 2 \\ & -12 + 2 = \boxed{-10} \end{aligned}$$

25.  $-5 \cdot 4 - (-5) \cdot (-3) + 20$

$$\begin{aligned} & -5 \cdot 4 + 5 \cdot (-3) + 20 \\ & -20 + (-15) + 20 \\ & -35 + 20 = \boxed{-15} \end{aligned}$$

26.  $-9 - (-15) - (-20) + 34$

$$\begin{aligned} & -9 + 15 + 20 + 34 \\ & 6 + 54 = \boxed{60} \end{aligned}$$

27.  $-74 + 9 \cdot (-8) + 100$

$$\begin{aligned} & -74 + (-72) + 100 \\ & -146 + 100 = \boxed{-46} \end{aligned}$$

28.  $10 - 8 \cdot (-7) - (7 \cdot 10)$

$$\begin{aligned} & 10 - (-56) - 70 \\ & 10 + 56 - 70 \\ & 66 - 70 = \boxed{-4} \end{aligned}$$

***Phase Four: Harder Order of Operations with Integers (box your answers)***

29.  $-5 \cdot (-2) \cdot (-3) + (-32) \div 8 + 10$

$$\begin{aligned} & -30 + -4 + 10 \\ & -34 + 10 \\ & \boxed{-24} \end{aligned}$$

30.  $5 - 12 - (-2) + (-5) \cdot 3$

$$\begin{aligned} & 5 - 12 + 2 + (-15) \\ & -7 + 2 + (-15) \\ & -5 + (-15) = \boxed{-20} \end{aligned}$$

31.  $53 - (-49) \div 7 - (-12)$

$$\begin{aligned} & 53 - (-7) - (-12) \\ & 53 + 7 + 12 \\ & \boxed{72} \end{aligned}$$

32.  $-3 \cdot (-4) \div (-6) \cdot 3 - 57 + (-23) + 2$

$$\begin{aligned} & 12 \div (-6) \cdot 3 - 57 + (-23) + 2 \\ & -2 \cdot 3 - 57 + (-23) + 2 \\ & -6 - 57 + (-23) + 2 \\ & -63 + -21 = \boxed{-84} \end{aligned}$$

33.  $-23 - 20 - (-17) + (-5) \cdot (-2) + 4 \cdot 5$

$$\begin{aligned} & -23 - 20 + 17 + 10 + 20 \\ & -43 + 47 \\ & \boxed{4} \end{aligned}$$

**Phase Five: Much Harder Order of Operations with Integers (box your answers)**

\*\*Fraction Bars count as grouping symbols. Simplify the numerator and denominator then divide

$$34. \frac{35 \div (-7) \cdot (-2)}{-5 + (-15) + 3 \cdot 5}$$

$$\frac{-5 \cdot (-2)}{-5 + (-15) + 15}$$

$$\frac{10}{-5 + 0}$$

$$\frac{10}{-5} = -2$$

$$35. -7 \cdot -4 - (-20) + \frac{-2 + (-2) - 2 + (-2)}{-8 \cdot (-2) \div 4}$$

$$28 + 20 + \frac{-2 + (-2) + (-2) + (-2)}{16 \div 4}$$

$$48 + \frac{-8}{4}$$

$$48 + (-2) = 46$$

$$36. \frac{-5 \cdot 4 \cdot (-3) \div (-10) + (-30)}{9 \div (-3) + 6 + (-3) \cdot (-2)}$$

**BONUS!**

(10 points possible between the two problems)

**Phase Six: Really Challenging Order of Operations with Integers (Box your answers)**

$$37. \frac{-3 \cdot (-4) \cdot (-2) \cdot (-2)}{-90 \div (-10) \cdot (-2) + 3 \cdot (-2)} + \frac{-23 + 10 - (-4) \cdot 3 + 3}{-4 + 9 - 7 - 3 \cdot 0}$$

$$38. \frac{[-30 - 5 \cdot (-4)] + (-9) \cdot (-5) - 2 \cdot 2 - 3 \cdot (-3)}{-6 \cdot 5 + (-10) \cdot (-2) - (-20) \div (-2)}$$

FOR HW

Split into 4 separate problems

**BONUS!**

Fraction, Decimal, Percent Conversion Reference Sheet

<p>To convert a <u>Fraction to a Decimal</u> you can use 2 methods...</p> <ol style="list-style-type: none"> <li>1. Write and equivalent fraction out of 10, 100, or 1000 (place value)</li> <li>2. Divide the numerator by the denominator</li> </ol>	<p>Ex.</p> <p>1. <math>3 \frac{2}{5} = 3.4</math>  <math>\frac{2}{5} \times 2 = \frac{4}{10}</math></p> <p>2. <math>\frac{5}{8} = 0.625</math>                  **see division below</p>	<p>Ex.</p> <p>1. <math>4 \frac{24}{30} = 480\%</math>                  **see work below</p> <p>2. <math>\frac{2}{3} = 66.\bar{6}\%</math>                  **see work below</p>	<p>To convert a <u>Fraction to a Percent</u> you can use 2 methods..</p> <ol style="list-style-type: none"> <li>1. Follow the rules to convert to a decimal then to a percent</li> <li>2. Create an equivalent fraction out of 100</li> </ol>
<p>To convert a <u>Decimal to a Fraction</u>...</p> <ol style="list-style-type: none"> <li>1. Identify how many place values there are (10, 100, 1000, etc)</li> <li>2. Rewrite as a fraction</li> <li>3. ALWAYS simplify when possible</li> </ol>	<p>Ex.</p> <p>1. <math>0.45 = \frac{45}{100} \div 5 = \frac{9}{20}</math></p> <p>2. <math>3.6 = \frac{36}{10} \div 2 = \frac{18}{5}</math></p>	<p>Ex.</p> <p>1. <math>2.75 = 275\%</math></p> <p>2. <math>0.035 = 3.5\%</math></p>	<p>To convert a <u>Decimal to a Percent</u>...</p> <ol style="list-style-type: none"> <li>1. Move the decimal place 2 spots to the right</li> <li>2. Add a percent sign</li> </ol>
<p>To convert a <u>Percent to a Decimal</u>...</p> <ol style="list-style-type: none"> <li>1. Take away the percent sign</li> <li>2. Move the decimal place 2 spots to the left</li> </ol>	<p>Ex.</p> <p>1. <math>85\% = 0.85</math></p> <p>2. <math>175\% = 1.75</math></p>	<p>Ex.</p> <p>1. <math>72\% = \frac{72}{100} \div 4 = \frac{18}{25}</math></p> <p>2. <math>35\% = \frac{35}{100} \div 5 = \frac{7}{20}</math></p>	<p>To convert a <u>Percent to a Fraction</u>...</p> <ol style="list-style-type: none"> <li>1. Take away the percent sign</li> <li>2. Write the percent over 100</li> <li>3. ALWAYS simplify when possible</li> </ol>

$15 \overline{) 225}$  →  $8 \overline{) 5000}$

$$\begin{array}{r} 0.628 \\ 8 \overline{) 5000} \\ \underline{-48} \phantom{0} \\ 20 \phantom{0} \\ \underline{-16} \phantom{0} \\ 40 \\ \underline{-40} \\ 0 \end{array}$$

$4 \frac{24}{30} \div 3 = \frac{8}{10} \rightarrow 4.8 \rightarrow 480\%$

$\frac{2}{3} \rightarrow 3 \overline{) 200}$

$$\begin{array}{r} 0.6 \\ 3 \overline{) 200} \\ \underline{-18} \\ 20 \\ \underline{-18} \\ 2 \end{array}$$

$0.\bar{6} = 66.\bar{6}\%$

Converting Fractions, Decimals, and Percents

Changing Fractions to Decimals:

- Divide the numerator by the denominator.

$$5 \overline{) 20} \begin{array}{r} 0.4 \\ -20 \\ \hline 0 \end{array} \quad \frac{2}{5} = 0.4$$

$$\frac{6}{7} = 0.857$$

$$2\frac{3}{5} = 2.6$$

Changing Fractions to Percents:

- Change the fraction to a decimal (numerator ÷ denominator)
- Move the decimal *twice* to the right.

$$\frac{3}{5} = \frac{6}{10} \quad \times 2$$

$$\frac{5}{8} = 62.5\%$$

$$\frac{1}{3} = 33.\bar{3}\%$$

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

$$0.625$$

$$0.\bar{3}$$

$$1.428$$

$$142.8\%$$

Changing Decimals to Fractions:

- Underline the last digit and identify its place value. That place value becomes the denominator.
- Remove the decimal from the number. That becomes your numerator.
- Simplify if possible.

$$.62 = \frac{62}{100} \div 2 = \frac{31}{50} \quad .4 = \frac{4}{10} \div 2 = \frac{2}{5} \quad .142 = \frac{142}{1,000} \div 2 = \frac{71}{500} \quad 3.60 = \frac{360}{100} \div 2 = \frac{36}{10} \div 2 = \frac{36}{5}$$

Changing Decimals to Percents:

- Move the decimal *twice* to the right.

$$.16 = 16\%$$

$$.04 = 4\%$$

$$1.42 = 142\%$$

$$.007 = 0.7\%$$

Changing Percents to Decimals:

- Move the decimal *twice* to the left.

27% =                      157% =                      .09% =                      8% =

0.27                      1.57                      .0009                      .08

Changing Percents to Fractions:

- First, change the percent to a fraction. (Move decimal twice to the left)
- Second, underline last digit (that place value will be your denominator), remove the decimal and that will be your numerator.
- Simplify if possible.

5% =                      48% =                      .3% =                      1.15% =

$\frac{5}{100} \div 5 = \frac{1}{20}$                        $\frac{48}{100} \div 4 = \frac{12}{25}$                        $\frac{3}{100}$                        $\frac{115}{100} \div 5 = \frac{23}{20}$

Fraction                      Decimal                      Percent

$\frac{1}{2}$	0.5	50%
$\frac{9}{100}$	.09	9%
$\frac{625}{1000} \div 25 = \frac{25}{40} \div 5 = \frac{5}{8}$	.625	62.5%
$\frac{28}{100} \div 4 = \frac{7}{25}$	0.28	28%
$\frac{2}{9}$	$0.\bar{2}$	$22.\bar{2}\%$
$\frac{3}{10}$	.3	30%
$2\frac{1}{5}$	2.2	220%
$\frac{8}{100} \div 4 = \frac{2}{25}$	1.08	108%

**COMPLETE ON YOUR OWN!!**

Ratio	Fraction	Decimal	Percent
example <b>3:4</b>	<b>3/4</b>	<b>0.75</b>	<b>75%</b>
		<b>0.25</b>	
			<b>60%</b>
<b>7:10</b>			
	<b>55/60</b>		
		<b>0.75</b>	
			<b>80%</b>
<b>8:13</b>			
	<b>19/20</b>		
			<b>45%</b>
	<b>4/5</b>		
		<b>1.5</b>	
<b>9:20</b>			
	<b>5/9</b>		
<b>2:3</b>			
	<b>7/8</b>		
<b>HOLD TILL NEXT WEEK - HAVE NOT YET LEARNED</b>		<b>0.666667</b>	
			<b>200%</b>