Math 20
Activity Packet
Winter 2023

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Use for notes, if you like.

Math 20 Activity #1
Whole Numbers

Names _____

In this activity, we will practice whole number arithmetic. Show all work for full credit. Feel free to do your work on scratch paper, to be submitted with your activity.

1) Do the following operations "**by hand**", and then check your results using **front rounding** and your **calculator**. SHOW <u>ALL</u> YOUR WORK!

a)
$$\begin{array}{r} 5{,}753 \\ +\ 2{,}970 \\ \hline \end{array}$$

Answer _____

Calculator √ ____

b)
$$\begin{array}{r} 16{,}325 \\ +\ 93{,}158 \\ \hline \end{array}$$

Answer _____

Calculator √ ____

c)
$$\begin{array}{r} 4{,}869 \\ -\ 2{,}648 \\ \hline \end{array}$$

Answer _____

Calculator √ ____

d)
$$\begin{array}{r} 942{,}713 \\ -571{,}390 \\ \hline \end{array}$$

Answer _____

Calculator √ ____

2) Do the following operations "**by hand**", and then check your results using **front rounding** and your **calculator**. SHOW <u>ALL</u> YOUR WORK!

a)
$$\begin{array}{r} 2{,}531 \\ \times\ 29 \\ \hline \end{array}$$

Answer _____

Calculator √ ____

b)
$$\begin{array}{r} 5{,}741 \\ \times\ 917 \\ \hline \end{array}$$

Answer _____

Calculator √ ____

c) 7850 ÷ 25

Answer _____

Calculator √ ____

d) 232,254 ÷ 391

Answer _____

Calculator √ ____

Math 20 Activity #2
Exponents & Prime Numbers

Names _____

In this activity, you will have the opportunity to practice working with prime numbers and applications of these numbers. USE YOUR CALCULATOR and <u>show ALL your work</u> for full credit. This activity is due at the next class meeting.

1) Write each power in expanded form, then evaluate the power using your calculator.

   a) 5^4 **Expanded form = _____**

   Evaluated = _____

   b) 3^5 **Expanded form = _____**

   Evaluated = _____

   c) 2^8 **Expanded form = _____**

   Evaluated = _____

2) A well-known saying speaks of starting with saving a penny. On the next day, doubling that and saving two pennies, saving four pennies on the next day, and so forth. Let's call the day you save two pennies (2^1 cents) "Day One". Answer the questions below:

	Day 0	Day 1	Day 2	Day 3	Day 4
Earned that day	1				
Total earned so far	1				

   a) How much would you be saving **only** on Day Four?

   Answer _____

   b) How much would you save from the beginning **through** Day Four? Fill out the table **first** to help.

   Answer _____

3) **Factor** each of the following numbers into its prime factors using the tree diagram method.

a) 40

40 = _____

b) 72

72 = _____

c) 128

128 = _____

d) 180

180 = _____

Math 20 Activity #3
The LCM, GCF, and Order of Operations   Names _____

Do the following problems using techniques discussed in class. Work together as a team on each problem and <u>show ALL your work</u> for full credit.

1)   Find the **GCF** (Greatest Common Factor) of the following sets of numbers:

   a)   132, 96, 36   **Answer** _____

   b)   66, 88, 154   **Answer** _____

   c)   16, 24, 88   **Answer** _____

2)   Find the **LCM** (Least Common Multiple) of the following sets of numbers:

   a)   2, 5, 7   **Answer** _____

   b)   3, 6, 11   **Answer** _____

   c)   3, 8, 9, 12   **Answer** _____

3) **Evaluate** the following expressions using **Order of Operations** (PEMDAS), one step at a time.

a) $12 + 2(3 + 7)$ **Answer** _____

b) $\dfrac{15 + 3}{2(8 - 5)}$ **Answer** _____

c) $24 - 2(3 + 2^2)$ **Answer** _____

d) $\dfrac{5^2 + 11}{5^2 - 7}$ **Answer** _____

Math 20 Activity #4
Fractions   Names _____

In this activity, you will have the opportunity to practice working with fractions. Show ALL work for full credit.
Neatness is very important! You CAN do this!

1) **Multiplication and Division**   Practice with rational numbers by completing the following problems. Do the work "**by hand**", and then use your **calculator** to verify your calculations. Neatness is very important. Show answers that are greater than one in BOTH mixed number and improper fraction form.

   a) $\frac{3}{5} \times \frac{10}{9} =$

   Answer _____

   b) $\frac{10}{7} \div \frac{15}{2} =$

   Answer _____

   c) $\frac{18}{11} \times \frac{22}{3} =$

   Answer _____

   d) $\frac{9}{10} \div \frac{12}{5} =$

   Answer _____

2)   John, Jay, and Jeb all work at a pizza restaurant. One night, they all work a closing shift. At the end of the night, they find there are 2 ³/₄ pizzas left. If they **divide** the leftover pizza up **evenly** amongst all three guys, how much pizza does each guy get?

   How much does pizza each guy get? _____

3) **Addition and Subtraction**   Practice with rational numbers by completing the following problems. Do the work "**by hand**", and then use your **calculator** to verify your calculations. Neatness is very important. Show answers that are greater than one in both mixed number and improper fraction form.

a) $\frac{3}{7} + \frac{2}{3} =$

Answer _____

b) $\frac{5}{12} + \frac{2}{15} =$

Answer _____

c) $\frac{12}{7} - \frac{5}{12} =$

Answer _____

d) $\frac{4}{9} - \frac{2}{15} =$

Answer _____

4) Bill, Bob, Betty, and Barbara are working a shift in Factory #3 and the engineer on duty tells them they need to clean all the conveyor belts in the factory. Bill says he has time to do $^1/_4$ of the work, Bob says he can do $^1/_3$, Betty says has no time available, and Barbara can do $^2/_5$ of the work. If everyone does the exactly the work they promised, **will all the conveyor belts be cleaned**?

Will the work get done? _____   **Why or why not?** _____

_____

Math 20 Activity #5
Decimals

Names _____

We will look at decimals and measurements in this activity. Note that the decimal place value names for places on the right of the decimal point end in "th", that is they all have "lisps"! Answer the questions below. Show ALL your work! Scratch paper is a very good idea.

1)   **Perform** the following operations "**by hand**", and then use your **calculator** AND an **estimation tactic** to check your answer. Show ALL your work for full credit.

   a)   18.56 + 52.82 =   **Answer** _____

   b)   165.2 − 69.4 =   **Answer** _____

   c)   23.05 x 9.551 =   **Answer** _____

   d)   362.5 ÷ 5.45 =   **Answer** _____
           (rounded to nearest tenth)

2)   On a road trip, you note that you travel **365.9 miles** the first day, **390.3 miles** the second day, and **410.9 miles** the third day. What is the **total distance** travelled for the three days?

                                   Answer _____

3) A rectangle measures **13.2 cm long by 9.4 cm wide**. Find the **area** of the rectangle remembering that the area is the length times the width.

Answer _____

4) You are travelling on a road trip and on the third day, you travel **773 miles** in a net time of **13.1 hours**. Find the **average speed** of for your road trip on the third day. Note, **average speed is total distance divided by total time**.

Answer _____

5) It's time to balance your checkbook. You are nearly done. You have a balance of **$1295.37** and three checks to deduct from that of amounts **$19.95**, **$43.81**, and **$412.96**. What is your new balance after deducting these checks?

Answer _____

Names _____

Do each of the problems below to practice operations with integers. Show ALL your work for full credit. This activity is due at the next class meeting.

1) **Add or subtract** each of the following "by hand", using the methods shown in class. Use your calculator ONLY to check your work, and indicate you have with a check mark.

   a)   12 + -35 =   **Answer _____**

                                                        Calculator √ ____

   b)   -17 + -15 =   **Answer _____**

                                                        Calculator √ ____

   c)   -21 – 33 =   **Answer _____**

                                                        Calculator √ ____

   d)   -351 – (-414) =   **Answer _____**

                                                        Calculator √ ____

2) **Multiply or divide** each of the following "by hand", using the methods shown in class. Use your calculator ONLY to check your work, and indicate you have with a check mark.

   a)   -35 × -17 =   **Answer _____**

                                                        Calculator √ ____

   b)   -1133 ÷ 11 =   **Answer _____**

                                                        Calculator √ ____

   c)   -159 ÷ -6 =   **Answer _____**

                                                        Calculator √ ____

   d)   -43 × 18 =   **Answer _____**

                                                        Calculator √ ____

3) What is the **difference** in elevation between the top of a mountain (elev. = 9460 feet) and the bottom of a nearby canyon (elev. = -264 feet)?

Answer _____

4) The Dow Jones Industrial Average experiences an average drop of 285 points <u>per day</u> for a 4-day period. **Express the total drop** for the Dow Jones over the entire period as an signed number (integer).

Answer _____

5) Suppose your checking account balance is $1573. Then you write checks for $485 and $289. **Calculate your new balance** and express it using an integer. Ignore "fees".

Answer _____

Math 20 Activity #7
Ratios & Proportions

Names _____

We will look at ratios and proportions in this activity. Show ALL work for full credit. Neatness is very important in mathematics! Make your luck.

1) **Solve** the following proportions using the method of cross-multiplication.

a) $\dfrac{2}{9} = \dfrac{a}{27}$

a = _____

b) $\dfrac{5}{6} = \dfrac{25}{H}$

H = _____

c) $\dfrac{4}{7} = \dfrac{T}{42}$

T = _____

d) $\dfrac{n}{5} = \dfrac{3}{4}$

n = _____

3) A photographer wishes to enlarge a 3-inch wide by 5-inch long photograph so that the print is 30 inches long. If the photographer is able to accomplish this, **how wide** will the enlargement be?

How wide? _____
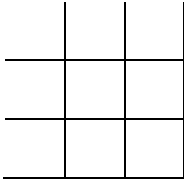
4) The rear axle ratio on my old 1971 Chevy Vega was 2.35:1. This means that if the drive train spins at 2.35 rpm (revolution per minute), the axle would spin at 1 rpm. **How many revolutions per minute** would the drive train spin if the axle spins 2500 rpm?

Drive train rpm? _____
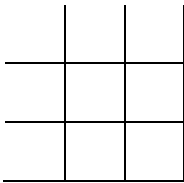
5) A new household cleaner can be made into a solution by mixing 3 parts of the cleaner with 10 parts of water. **How many cups of water** do you need if you are using 1 ½ cups of the cleaner? Hint: "Parts" can be any measurement unit … including cups.

How much water? _____
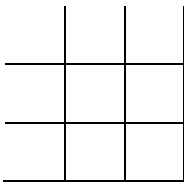
6) A cookie recipe calls for 2 cups of flour and a 12-ounce bag of chocolate chips. The recipe will make 5 dozen cookies. **How many cups of flour and ounces of chocolate chips will you need** (not counting the chocolate chips you eat while making the cookies!), to make 10 dozen cookies? Hint: Compare the cups of flour to the number of cookies and the ounces of chocolate chips to the number of cookies separately.

Cups of flour? _____   **Ozs. of choc. chips?** _____
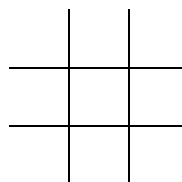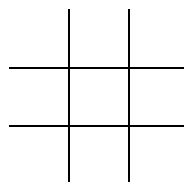
Math 20 Activity #8
Percents

Names _____

This activity is meant to provide the student with practice in working with percents. Show all your work. Use scratch paper as needed. This activity is due at the next class meeting.

1) **Find the percent** for each ratio given. Round your result to the **nearest whole percent**, as needed.

   a) $\dfrac{2}{5}$

   Answer = _____

   b) $\dfrac{10}{3}$

   Answer = _____

   c) $\dfrac{3}{7}$

   Answer = _____

   d) $\dfrac{15}{32}$

   Answer = _____

2) Change the following from **percents to decimals** or **decimals to percents**, whichever is most appropriate. Always reduce as appropriate.

   a) 28%

   Answer = _____

   b) 0.648

   Answer = _____

   c) 1.55

   Answer = _____

   d) 110%

   Answer = _____

3) Change the following from **percents to fractions**. Always reduce as appropriate.

   a) 35%

   Answer = _____

   b) 57%

   Answer = _____

   c) 82%

   Answer = _____

   d) 143%

   Answer = _____

4) Your gross pay for your paycheck is $1524.00, but the take-home pay is $1188.72. What **percent** of your gross pay do you get to take home?

Percent you take home = _____

5) After discounts and special savings at the local clothing store, you learn you have to pay only 30% of an item's original price. If your final cost is only $8.69, what was the **original price** of the item?

Original price = _____

6) You get to discount 30% from the price of an item at the shopping mall. The regular price is $49.95.

a) How much of the price do you get to **discount in dollars**?

Discount Amount = _____

b) How much do you **finally end up paying** for the item?

Final price = _____

Math 20 Activity #9
Conversions   Names _____

In the United States, we commonly use two different systems of measurements to measure quantities, the American system and the Metric system. Some common units of measurement are:

	American	**Metric**
Length	feet	meter
Weight	pounds	kilograms
Time	seconds	seconds
Power	horsepower	joules

In this activity, **use unit fractions** to help you convert each measurement to the indicated units, showing ALL your work.

Problems: Convert the following measurements to the proposed units.

1)   543.2 feet to inches   **Result** _____

2)   3.5 quarts to pints   **Result** _____

3)   19.3 yards to feet   **Result** _____

4)   140 centigrams to grams   **Result** _____

5)   29,500 milliliters to liters   **Result** _____

6)   45.7 dekaliters to liters   **Result** _____

7)   2500 pounds to kilograms   **Result** _____

8)   3.39 meters to feet   **Result** _____

9)   22.65 grams to ounces   **Result** _____

10)   24.5 °C to °F   **Result** _____

Math 20 Activity #10
Graphs and Statistics   Names _____

Do the following problems, showing all your work. Use scratch paper as needed. This activity is due at the next class meeting.

1)   Consider the following **bar graph**. Answer the questions that follow.

   a)   Which **teacher** has the **highest** average percent for their students?
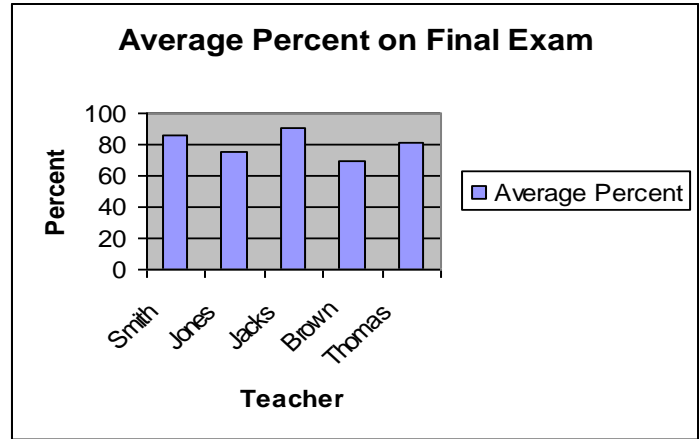
   _____

   b)   Which **teacher** has the **lowest** average percent for their students?

   _____

   c)   **Order the teachers** (least to greatest) by their student's average percent on final exam scores.

Average Percent on Final Exam

_____

2)   Use the space below to construct a **bar graph** from the following data on defects of plastic body side panels manufactured for a Saturn Ion. Be as neat as possible … it is part of your grade.

Type of Defect	Scratch	Dent	Puncture	Missing Piece	Other
Number of Defects	18	16	2	6	8
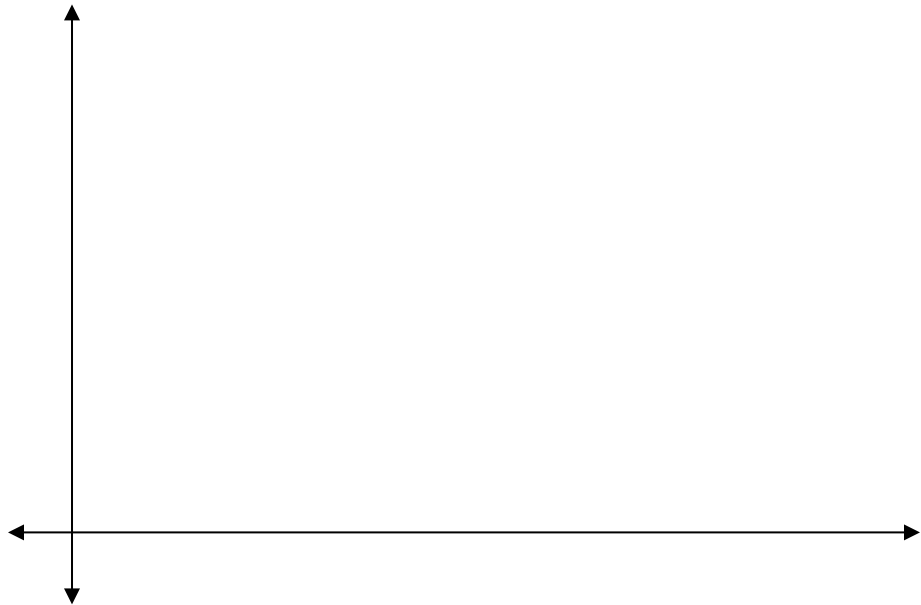
3) Build a **line graph** from the following data. Answer the questions below from the line graph.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Inches of rain	12	14	21	25	23	18	9	7	12	18	24	30

a) **When** would you expect the rainfall to be the lowest **next year**?

Month of lowest rainfall? _____

b) **When** would you expect the rainfall to be the highest **next year**?

Month of highest rainfall? _____

c) **Describe any trends** in rainfall amounts for the year in your own words. Be detailed.

_____

_____

d) **Find the mean** number of inches of per month from the given data.

Mean monthly rainfall _____

e) **Find the median** number of inches of per month from the given data.

Median monthly rainfall _____