Department of Mathematics
Moreno Valley College

Mathematics 52

Course ID: (27488)
First Midterm
Fall 2016

Date: October 5th, 2016 **Time: 2:00 PM – 4:05 PM**

Professor: Mohammed Kaabar

P1	P2	P3	P4	P5	P6	P7	P8	EC1	EC1	Total
20	20	10	10	10	10	10	10	5	6	100

Student Name: Mohammed Kaabar

Student ID: – Solution –

Exam Instructions:

1- **Do not open this exam until you are told to begin.**
2- **Calculators are not allowed.**
3- **This exam has 8 questions and two extra credit questions.**
4- **Make sure you answer all questions.**
5- **Turn off all cell phones and remove all headphones.**
6- **Communication of any kind is not allowed during the exam**
7- **Cheating = "F"**

Student Signature:

Problem 1 (20 points): Determine whether the following is **TRUE** or **FALSE** and if it is **FALSE,** then **EXPLAIN** why it is false:

a. $0.\overline{3} > 0.43$ False because $0.\overline{3} \approx 0.3333 < 0.43$

b. $-500.34 \leq -20.87$ True

c. $\pm 5.23 \leq \pm 5.23$ True

d. $3\frac{1}{5} = \frac{16}{5}$ True

e. $15 \cdot \left(\frac{1}{3}\right) = 5$ True

f. $-\left|-\frac{100}{2}\right| \geq \{(3455.45) - (4000.23)\}$ True

$-50 \geq -544.78$

g. $\left(\frac{1}{3} - 0.\overline{3}\right) > (-0.022 + 0.010)$ True

$0 > -0.012$

Hint: $\frac{1}{3}$ ***is approximatly equal to*** 0.333333333333

h. $2^0 < 2^{1-0.5}$

1

$2^{0.5} = 2^{\frac{1}{2}} = \sqrt{2} \approx 1.414$

True

Hint: ***any number to power zero is*** 1, ***and*** $2^{\frac{1}{2}} = \sqrt{2} \approx 1.4142$

i. Zero divided by any non-zero number is zero True

j. Set of real numbers ($\mathbb{R}$) is considered the largest set of numbers. True

Problem 2 (20 points): Answer each of the following questions:

a. What is the definition of **constant**? is defined as something that does not change or a letter stands only for one number, then this letter is called constant.

b. Give a word example of **constant**?

1- Date of Birth. or any other reasonable
2- Production date of your car answers.

c. What is the definition of **irrational number**?

is defined as a number whose decimal part does not terminate or repeat.

d. Give a numerical example of **rational number**?

$\frac{1}{3}$, $0.\overline{3}$, 3.59 or any other examples.

e. What is the general form of **percent**? is defined as the number of hundredths. In other words, a certain number as a part of 100. Percent is denoted by $\boxed{?}\% = \frac{\boxed{?}}{100}$.

f. Write the **general form** of **additive identity**?

For any real numbers x, y, and z, then we have:

$x + 0 = x$ or $y + 0 = y$ or $z + 0 = z$.

g. Write $\frac{13}{2}$ in a **percent form**?

$\frac{13}{2} = 6.5 = \boxed{650\%}$

h. Write $\frac{1}{4}\%$ in a **decimal form**?

$\frac{1}{4}\% = \frac{1/4}{100} = \frac{0.25}{100} = \boxed{0.0025}$

i. Write the **four important steps** in the **order of operation**?

1- Evaluate the inside of brackets.
2- Evaluate powers (exponents)
3- Evaluate the multiplication & division from left to right.
4- Evaluate the addition & subtraction from left to right.

j. What is the definition of **the set of integers**?

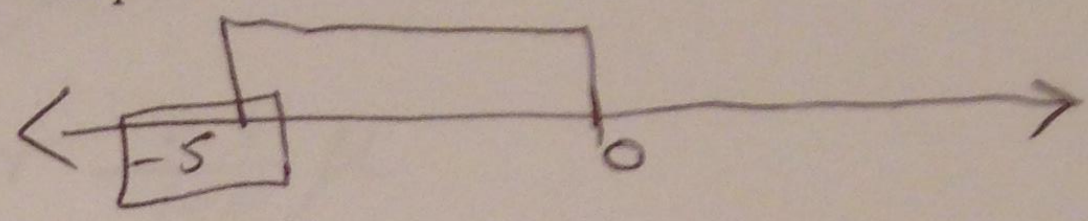
is a set that has negative numbers, zero, and positive numbers such as $\{\ldots, -3, -2, -1, 0, 1, 2, 3, \ldots\}$

Problem 3 (10 points): Add the following using the **NUMBER LINE for EACH ONE**:

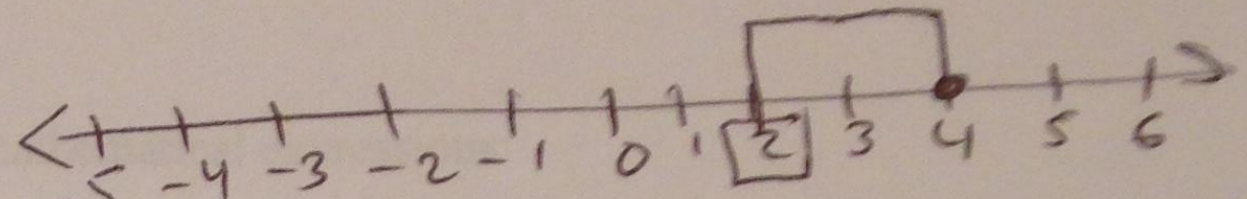
Note: Make sure that you have one number line for each part.

a. $0-5$ = $0+(-5)$

$=\boxed{-5}$



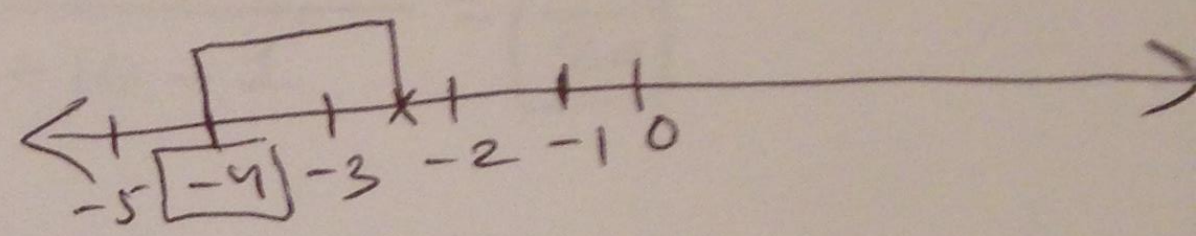
b. $4+(-2)=\boxed{2}$



c. $-2.5-1.5$ = $-2.5+(-1.5)$

$=\boxed{-4}$

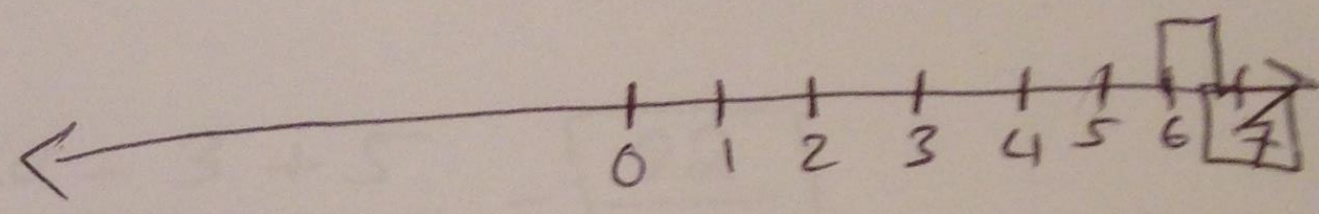
-2.5



d. $((-3)\cdot(-2))-((-1\cdot|-1|))$

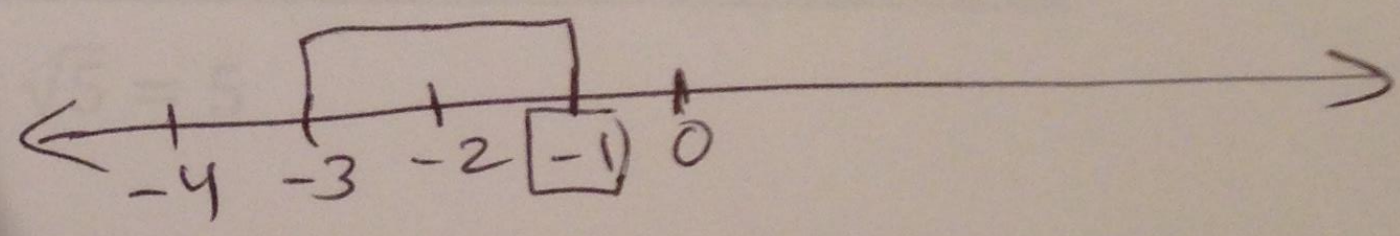
$(6)-(-1)$

$(6)+1=7$



e. $\frac{15}{-5}+\left(-\frac{14}{-7}\right)$

$(-3)+(2)=\boxed{-1}$



Problem 4 (10 points): Translate each of following English phrases to the math language **(algebraic expression)**

a. Three more than two times some number, x, added to the product of two and some number, y. $3+2x+2y$

b. Five added to seventeen times some number. We assume that some number is K, then: $5+17K$

c. Six more than two multiplied by some number. We assume that some number is μ, then $6+2\mu$

d. Twenty-three percent of some number, μ.

$23\%\,\mu$ or 0.23μ or $\frac{23}{100}\mu$

e. Nine plus ninety-times some number, δ.

$9+90\delta$

Problem 5 (10 points): Simplify the following mathematical expressions:

a. $$\frac{\sqrt[3]{125}+2^3+\left(\frac{15}{3}\right)+\left(\frac{1000.66}{2346.67}\right)^0}{\left(\frac{22}{2}\right)+|-20+10|-1} = \frac{5+8+5+1}{11+10-1} = \frac{19}{20}$$

b. $$\frac{2\cdot\sqrt{100}-|-23+20|+25^{\frac{1}{2}}}{2+(\sqrt{17}\cdot\sqrt{17})} = \frac{20-3+5}{2+17} = \frac{22}{19}$$

Hint: **square root of a number multiplied by a square root of the same number is the number itself, for example,** $\sqrt{5}\cdot\sqrt{5}=5$

Problem 6 (10 points): Solve the following linear equations:

a.

$$4(\beta + 3) = 10 + 2$$

$\Rightarrow 4\beta + 12 = 12$

$\Rightarrow 4\beta = 12 - 12$

$\Rightarrow \frac{4\beta}{4} = \frac{0}{4} \Rightarrow \boxed{\beta = 0}$ the solution of linear equation.

b.

$$5\left(\frac{1}{5}\psi - 2\right) = 5\psi + 10$$

$\Rightarrow 5\left(\frac{1}{5}\right)\psi - 5(2) = 5\psi + 10$

$\Rightarrow \psi - 10 = 5\psi + 10$

$\Rightarrow \psi - 5\psi = 10 + 10$

$\Rightarrow \frac{-4\psi}{-4} = \frac{20}{-4}$

$\Rightarrow \boxed{\psi = -5}$ The solution of linear equation

Problem 7 (10 points): In Fourth of July Day, Isabella is a successful businesswoman in California, and she decided to go to one of the Ford dealerships in Santa Monica, California to buy a 2014 Ford F-150 Raptor XT Baja Edition. The price of this car was listed as $100,000. A Fourth of July discount of 10% on the price of this car, followed by another discount of 3% because she is working in a partner company of the Ford dealership, is equivalent to a single discount of what percent of the original price?

Solution:

Original price = $100,000, Discount 1 = 10%, Discount 2 = 3%. . % = ?!

the deductible value for the price after discount 1 is $(100,000) \cdot \left(\frac{10}{100}\right) = \boxed{10,000}$

So, the price after discount 1 becomes: $100,000 − $10,000 = $\boxed{\$90,000}$

the deductible value for the price after discount 2 is $(90,000) \cdot \left(\frac{3}{100}\right) = \boxed{2,700}$

So, the price after discount 2 becomes: $90,000 − $2,700 = $\boxed{\$87,300}$

therefore, the final price is ($100,000 − $87,300) = $12,700 less than the original price.

Hence, $\frac{12,700}{100,000} = 0.127 = \boxed{12.7\%}$

Problem 8 (10 points): Ross is working in a real estate company in Palm Spring, CA. He earned $50,000 profit from the sale of a mobile house in Palm Spring, CA. So, he decided to invest part at 3% interest, and the remaining at 1% interest. He received a total of $3000 interest per year. How much did Ross invest at 3%.

Solution:

e assume that the total amount invested at 3%. terest rate is β, then we obtain the following: $50,000 - \beta$) which is the amount invested at % interest rate.

Total amount earned per year is $3,000 interest.

Therefore, $3{,}000 = 0.03\beta + (50{,}000 - \beta)\cdot(0.01)$

$\Rightarrow 3{,}000 = 0.03\beta + (50{,}000)(0.01) - (0.01)\beta$

$\Rightarrow 3{,}000 - 500 = 0.02\beta$

$\Rightarrow \frac{2{,}500}{0.02} = \frac{0.02\beta}{0.02}$

$\Rightarrow \beta = \frac{2{,}500}{0.02} = \frac{2{,}500}{\frac{2}{100}} = 2{,}500 \cdot \frac{100}{2} = \$125{,}000$

Therefore, Ross invested $60,000 at 3% interest rate.

Extra Credit Problem 1 (5 points): Simplify the following mathematical expressions

$$\frac{\left\{(-1)^7 \cdot \left(\frac{\sqrt{81} - |-23+20| + 121^{\left(\frac{1}{4}\right)^{\frac{1}{2}}}}{6\sqrt{100} - \sqrt{64}}\right) + \left\{\frac{\left\{2^{-3+2+5-2} + 3 \cdot (3+2--1) \cdot \sqrt[3]{125} + \left(\frac{15}{3}\right)\right\}}{|-20+10| - -\left(\frac{4047682}{2213}\right)^{5-4+12-20+7}}\right\}\right\}^{2-5}}{\left\{\frac{2^{-1}\left(\frac{10}{0.5}\right) + \sqrt[4]{390625} + e^{1-2+1} + |12-50|^{100-99-1} - 1}{\left(\frac{50}{2}\right) - 12 + 2^0 + 3 \cdot \sqrt{25}}\right\}}$$

$$= \frac{\left(\frac{-9+3-11}{52}\right) + \left(\frac{2+90+5}{3}\right)}{\left(\frac{10+25+1+1-1}{25-12+1+15}\right)}$$

$$= \boxed{\frac{\left(\frac{-17}{52}\right) + \left(\frac{97}{3}\right)}{\left(\frac{36}{29}\right)}}$$

Extra Credit Problem 2 (6 points): Answer each of the following questions:

a. Write down the course ID for our MAT-52 class? 27488

b. Where is our MAT-52 classroom located? HUM 337

c. From which university in U.S. your Professor Mohammed Kaabar graduated?

d. Your Professor Mohammed Kaabar has several favorite hobbies other than teaching mathematics. List one of them. Fishing, Hiking, and off-roading

e. If you pass this class successfully, what will be the next coming math class? MAT-53

f. Your Professor Mohammed Kaabar wrote two math textbooks for two different math classes. List one of those math classes.

1- A First Course in Linear Algebra

2- A Friendly Introduction to Differential Equations.

I wish you best of luck in Exam 1

Best Regards

Professor: Mohammed Kaabar