

Name: _____

* ANSWER KEY *

10/22/2014

Math 150 Mathematics for the Contemporary World

Quiz 2

Please show all work and box your final answers. If you need more room, you may use the backs of the pages. Calculators are allowed, but cellphones are not. Good luck!

1. The number of CD's shipped in the United States decreased from 942 million in 2000 to 511 million in 2008.

(a) (2 points) What was the absolute change?

$$511 \text{ MILLION} - 942 \text{ MILLION} = \boxed{-431 \text{ MILLION}}$$

(b) (2 points) What was the percent change?

$$\frac{-431 \text{ MILLION}}{942 \text{ MILLION}} \times 100\% = \boxed{-45.8\%}$$

2. (4 points) The number of housing foreclosures in 2008 was 3.98 million, up 81% over 2007. How many foreclosures were there in 2007?

$$3.98 \text{ MILLION IS } 181\% \text{ OF } [2007 \text{ FORECLOSURES}]$$

$$3,980,000 = 1.81 \times [2007 \text{ FORECLOSURES}]$$

$$\frac{3,980,000}{1.81} = [2007 \text{ FORECLOSURES}] = \boxed{2,198,895}$$

3. (4 points) Your dinner bill was \$42.50 and you left \$50. What percent tip did you leave? (Ignore taxes for this question.)

$$\frac{50 - 42.50}{42.50} \times 100\% = \boxed{17.6\%}$$

4. (4 points) A high school reports that its students SAT scores were down by 30% for one year. The next year, however, SAT scores rose by 50%. The high school principal announces, "Overall, SAT scores have improved by 20% over the past two years." This is false. State the true percent change over the past two years.

SAT SCORES START AT 100

AFTER ONE YEAR THEY DROP 30% (OF 100) TO 70

AFTER ANOTHER YEAR THEY RISE 50% (OF 70) TO 105

OVERALL SAT SCORES IMPROVED BY 5%

5. Convert the following numbers to scientific notation

(a) (2 points) 6247.89

$$\boxed{6.24789 \times 10^3}$$

(b) (2 points) 0.000100325

$$\boxed{1.00325 \times 10^{-4}}$$

6. Perform the following calculations.

(a) (2 points) $(2.3 \times 10^{25}) \times (3 \times 10^{14})$

$$= 2.3 \times 3 \times 10^{25} \times 10^{14}$$

$$= \boxed{6.9 \times 10^{39}}$$

(b) (2 points) $(8.1 \times 10^{-12}) \div (2.7 \times 10^{-8})$

$$= \frac{8.1 \times 10^{-12}}{2.7 \times 10^{-8}} = \frac{8.1}{2.7} \times \frac{10^{-12}}{10^{-8}} = \boxed{3 \times 10^{-4}}$$

$$-12 - (-8) = -12 + 8 = -4$$

7. (4 points) The following table shows how the the average price of 1 gallon of unleaded gas in the Unites States has changed over the years. Fill in the three missing index numbers. (Note that the price of gas in 2008 is being used at the reference value.)

Year	Price	Index
2004	\$1.59	52.1
2006	\$2.32	76.1
2008	\$3.05	100
2010	\$2.73	89.5

$$\text{INDEX} = \frac{\text{VALUE}}{\text{REF. VALUE}} \times 100$$

8. (4 points) The table below shows how the average Consumer Price Index in the United States has changed over the years. If a certain standard of living required a salary of \$40,000 in 1990, the same standard of living would have required what salary in 2010?

Year	CPI
1990	127.4
2000	168.8
2010	216.7

$$\$40,000 \cdot \frac{\text{CPI 2010}}{\text{CPI 1990}} = \$40,000 \cdot \frac{216.7}{127.4}$$

$$= \$68,037.68$$

9. (4 points) Use the table from question 8 to calculate the rate of inflation from 2000 to 2010.

$$\frac{\text{CPI 2010} - \text{CPI 2000}}{\text{CPI 2000}} \times 100\%$$

$$= \frac{216.7 - 168.8}{168.8} \times 100\% = 28.4\%$$