

MAT 010: Examination #3

Name: _____ (Five points)

1. Change each percent to a fraction or a mixed number. (Five points)

a) $66\frac{2}{3}\%$

$$66\frac{2}{3}\% = \frac{(66 * 3) + 2}{3}\% = \frac{198 + 2}{3}\% = \frac{200}{3}\% = \frac{200}{3} * \frac{1}{100} = \frac{2}{3}$$

2. Change each percent to a decimal. (Five points)

a) 82.4%

$$82.4\% = 82.4 * \frac{1}{100} = 0.824$$

3. Change each decimal to a percent. (Five points)

a) 1.07

$$1.07 = 1.07 * 100\% = 107\%$$

4. Change each fraction to a percent. (Five points each)

a) $2\frac{1}{6}$

$$2\frac{1}{6} = \frac{(6 * 2) + 1}{6} = \frac{13}{6} = \frac{13}{6} * 100\% = \frac{1300}{6}\% = \frac{650}{3}\% = 216\frac{2}{3}\%$$

5. Solve the following. Show all work for full credit. (Five points each)

a) What is 6% of 9?

$$6\% \text{ of } 9 \rightarrow \frac{6}{100} * 9 = 0.06 * 9 = 0.54$$

b) 8 is 20% of what number?

Let that number be x

$$20\% \text{ of } x = 8 \rightarrow \frac{20}{100} * x = 8 \rightarrow x = 8 * \frac{100}{20} = 40$$
$$x = 40$$

c) What percent of 5 is $\frac{1}{2}$?

To find percentage we divide numbers and multiply by 100

$$\rightarrow \frac{\frac{1}{2}}{5} * 100\% = \frac{1}{10} * 100\% = 10\%$$

6. Solve the following word problem. Show all work. (10 points)

An antique store bought a table for \$90 and resold it for \$120. What is the percent markup?

$$\text{Markup}\% = \frac{\text{Selling Price} - \text{Product cost}}{\text{Product cost}} * 100\% = \frac{120 - 90}{90} * 100\%$$
$$= \frac{1}{3} * 100 = 100\% = 33\frac{1}{3}\% \text{ or } 33.33\%$$

7. Change the following into scientific notation. (5 points)

37, 208

The proper format for scientific notation is $a \times 10^b$ where a is a number or decimal number such that the absolute value of a is greater than or equal to one and less than ten or, $1 \leq |a| < 10$.

b is the power of 10 required so that the scientific notation is mathematically equivalent to the original number.

Move the decimal point 4 places to the left.

$$3.7208 * 10^4$$

8. Change the following into standard notation. (5 points)

4.321×10^{-5}

$$= 4.321 * 10^{-5} = 4.321 * \frac{1}{10^5} = 4.321 * \frac{1}{100000} = 0.00004321$$

9. Perform the indicated operations and write your final answer using scientific notation. (10 points each)

a) $(4 \times 10^{-10})(7 \times 10^6)$

$$\begin{aligned} \text{a)} \\ &= (4 \times 10^{-10})(7 \times 10^6) \\ &= 4 \times 7 \times 10^{-10} \times 10^6 \\ &= 28 \times 10^{-10+6} \\ &= 28 \times 10^{-4} \\ &= 28 \times 10^{-4} \times \frac{10}{10} \\ &= 2.8 \times 10^{-3} \end{aligned}$$

b) $\frac{1.4 \times 10^{-2}}{7 \times 10^{-8}}$

$$\begin{aligned} \text{b)} \\ &= \frac{1.4 \times 10^{-2}}{7 \times 10^{-8}} \\ &= \frac{1.4}{7} \times \frac{10^{-2}}{10^{-8}} = 0.2 \times 10^{-2+8} \\ &0.2 \times 10^6 = 0.2 \times \frac{10}{10} \times 10^6 \\ &= 2 \times 10^5 \end{aligned}$$

10. Change each quantity as indicated. You must show all work and use “unit fractions” to complete the task. (5 points each)

a) 4 months = _____ hours

$$\begin{aligned} \text{a)} \\ \text{We know that} \\ \quad 1 \text{ month} = 30.417 \text{ days} \\ \quad 1 \text{ day} = 24 \text{ hours} \\ \text{So,} \\ 4 \text{ months} = 4 \times 30.417 \text{ days} = 121.668 \text{ days} \\ \quad 1 \text{ day} = 24 \text{ hours} \\ \rightarrow 121.668 \text{ days} = 24 \times 121.668 \text{ hours} \\ \rightarrow 4 \text{ months} = 2920.032 \sim 2920 \text{ hours} \end{aligned}$$

b) 50 mm = _____ meters

$$\begin{aligned} \text{b)} \\ 1\text{m} &= 100\text{cm} \\ 1\text{ cm} &= 10\text{mm} \\ 1\text{m} &= 10 \times 100 \text{ mm} \\ 1\text{m} &= 1000\text{mm} \\ 1\text{mm} &= \frac{1}{1000} \text{ m} \\ 50\text{mm} &= 50 \times \frac{1}{1000} \text{ m} \\ 50\text{mm} &= 0.05\text{m} \end{aligned}$$

11. Perform the indicated operations and change units when necessary. (Five points each)

a) 2 ft. – 3 inches

b) 5 years 7 months + 3 years 11 months

a) 1 ft. = 12 inches ⇒ 2 ft. = 2×12 inches = 24 inches 2ft. – 3 inches = 24 inches – 3 inches ⇒ 21 inches = 12 inches + 9 inches ⇒ 1 ft.+ 9 inches ⇒ 1ft. 9 inches	b) 1 year = 12 months 5 years = (5×12) months = 60 months 3 years = (3×12) months = 36 months 5 years 7 months = $60 + 7 = 67$ months 3 years 11 months = $36 + 11 = 47$ months ⇒ 5 years 7 months + 3 years 11 months ⇒ = $67 + 47$ months = 114 months ⇒ 114 months = 96 months + 6 months ⇒ = (12×9) months + 6 months ⇒ 9 years 6 months or 9.5 years
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