Math 135 – Practice Test 3

Practice Test **Name:** Solution Set
Instructor: Patricia Wrean

Allowed calculators: Sharp EL 531 and the TI BAII. **Total: 25 points**

Part I: For these short-answer questions, you do not need to show any work. Place your final answer in the space provided. Each answer is worth one point.

1. (1 point) Write 4.2×10^{-6} in decimal notation. 0.0000042

2. (3 points) Perform the indicated operations, then simplify.
   (a) $(3y+1)(3y-1)$ $9y^2 - 1$

   (b) $(5z-4)^2$ $= (5z-4)(5z-4)$
   $= 25z^2 - 20z - 20z + 16$
   $= 25z^2 - 40z + 16$ $25z^2 - 40z + 16$

   (c) $\dfrac{6m^3n^{-2}}{8m^7n^{-4}}$ $= \dfrac{3}{4} m^{3-7} n^{-2+4}$
   $= \dfrac{3}{4} m^{-4} n^2$ $3/4\, m^{-4} n^2$ or $\dfrac{3n^2}{4m^4}$

3. (1 point) Write the following expression in radical form. You do not need to simplify.
   $36^{1/2}$ $\sqrt{36}$

Part II: For these questions, show your work and write your final answer in the space provided.

4. (2 points) Perform the indicated operations, then simplify. Leave your answer in scientific notation.

$$\frac{(7\times 10^{-5})(6\times 10^{6})}{(2\times 10^{-3})} = \frac{7\times 6}{2}\times\frac{10^{-5}\times 10^{6}}{10^{-3}}$$

$$= 21\times\frac{10^{1}}{10^{-3}}$$

$$= 21\times 10^{4}$$

$$= 2.1\times 10\times 10^{4}$$

$$= 2.1\times 10^{5}$$

2.1×10^{5}

5. (3 points) Simplify the following expression. Your answer should not have any negative exponents.

$$\left(\frac{3h^{5}}{5^{0}h^{-3}}\right)^{-3} = \left(\frac{3h^{8}}{1}\right)^{-3}$$

$$= 3^{-3}h^{-24}$$

$$= \frac{1}{3^{3}h^{24}}$$

$$= \frac{1}{27h^{24}}$$

$\frac{1}{27h^{24}}$

6. (3 points) Divide, writing your answer in the form $Quotient + \frac{Remainder}{Divisor}$.

$(2x^2+3x+1)\div(2x+5)$

$$\begin{array}{r} x-1 \\ 2x+5\overline{)\,2x^2+3x+1} \\ -(2x^2+5x) \\ \hline -2x+1 \\ -(-2x-5) \\ \hline 6 \end{array}$$

$$x-1+\frac{6}{2x+5}$$

7. (3 points) Write an algebraic expression for each quantity. Let x represent the unknown value.

   (a) Four times a quantity decreased by eleven $4x - 11$

   (b) Five more than one-third of a number $\frac{1}{3}x + 5$

   (c) The simple interest after two years when an amount is invested at 4%

   $0.08x$

$I = Prt$

$= x(0.04)(2)$

$= 0.08x$

8. (3 points) Morgan and Alexa share a house together. Alexa makes \$4500 more per year than Morgan does. If together they earn \$98500, how much do each of them earn per year?

   Write your answer in the form of a sentence.

let x = Morgan's salary

$x + 4500$ = Alexa's salary

$x + (x + 4500) = 98500$

$2x + 4500 = 98500$

$2x = 94000$

$x = 47000$

Morgan earns \$47000 and Alexa earns \$51500 per year.

9. (3 points) Kemal has just deposited \$150 in the bank. This deposit was made of of \$5 bills and \$10 bills. If Kemal had three fewer \$10 bills than \$5 bills, how many of each type of bill did he have?

   Write your answer in the form of a sentence.

let x = number of \$5 bills

$x-3$ = " " \$10 "

$$5x + 10(x-3) = 150$$
$$5x + 10x - 30 = 150$$
$$15x - 30 = 150$$
$$15x = 180$$
$$x = 12$$

Kemal had 12 \$5 bills and 9 \$10 bills.

10. (3 points) The second side of a triangle is 5 cm longer than the first side. The third side of the triangle is twice the first side. If the perimeter of the triangle is at least 37 cm, what are the possible lengths for the first side of the triangle?

    Write your answer in the form of a sentence, being sure to include units.

let x = the length of the first side

$x+5$ = " second "

$2x$ = " third "

$$x + (x+5) + 2x \geq 37$$
$$4x + 5 \geq 37$$
$$4x \geq 32$$
$$x \geq 8$$

The first side is at least 8cm long.