

Math 135 – Test 3: Version A

March 29, 2019

Name: Solution Set

Instructor: Patricia Wrean

Allowed calculators: Sharp EL 531 and the TI BAIL.

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 -35000000 in scientific notation.

-3.5×10^7

missing - at front $\left(-\frac{1}{2}\right)$

35 at front $\left(-\frac{1}{2}\right)$

2. (3 points) Perform the indicated operations, then simplify.

(a) $(4k + 3)^2 = (4k + 3)(4k + 3)$
 $= 16k^2 + 12k + 12k + 9$
 $= 16k^2 + 24k + 9$

$16k^2 + 24k + 9$

(b) $(7 - 2b)(7 + 2b)$

$49 - 4b^2$

(c) $(9x^3y^5)(-8x^4y)$

$-72x^7y^6$

$\left(-\frac{1}{2}\right)$ minor error

(-1) incorrect operation

3. (1 point) Write the following expression in radical form. You do not need to simplify.

$4^{3/2}$

any of
 $\sqrt{4^3}$ or $(\sqrt{4})^3$ or $\sqrt{64}$

not in radical form (-1)

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

4. (2 points) Perform the indicated operation, then simplify.

$$(2x - 3)(x^2 + 5x - 6)$$

$$\underline{2x^3 + 7x^2 - 27x + 18}$$

$$(2x - 3)(x^2 + 5x - 6)$$

$$2x^3 + 10x^2 - 12x - 3x^2 - 15x + 18$$

$$2x^3 + 7x^2 - 27x + 18$$

$$(2x - 3)(x^2 + 5x - 6)$$

$$2x^3 - 3x^2 + 10x^2 - 15x - 12x + 18$$

$$2x^3 + 7x^2 - 27x + 18$$

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

$$\left(\frac{2w^{-5}x^0}{3w^3}\right)^{-1}$$

$$= \left(\frac{2w^8}{3}\right)^{-1}$$

$$= \frac{2^{-1}w^8}{3^{-1}}$$

$$= \frac{3w^8}{2}$$

$$\underline{\frac{3w^8}{2}}$$

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

$$(x^3 + 3x - 16) \div (x - 2)$$

$$\begin{array}{r} x^2 + 2x + 7 \\ x - 2 \overline{) x^3 + 0x^2 + 3x - 16} \\ \underline{-(x^3 - 2x^2)} \\ 2x^2 + 3x \\ \underline{-(2x^2 - 4x)} \\ 7x - 16 \\ \underline{-(7x - 14)} \\ -2 \end{array}$$

$$\boxed{x^2 + 2x + 7 - \frac{2}{x - 2}}$$

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

(a) Three less than half a number

$$\frac{1}{2}x - 3$$

(b) Twice the sum of a number and five

$$2(x + 5)$$

(c) The new price when the original price is reduced by 10%

$$0.9x$$

$$x - 0.1x$$

$$0.9x$$

8. (3 points) Judith invested some money at 2% per year in simple interest for three years. If at the end of that time she had earned \$45 in interest, how much did she originally invest?

Write your answer in the form of a sentence.

let $x =$ amount Judith invested

$$I = prt$$

$$45 = x(0.02)(3)$$

$$x = \frac{45}{(0.02)(3)}$$

$$= 750$$

Judith invested \$750.

9. (3 points) At his new job, Jean-Paul worked 35 hours the first week, 42 hours the second week, and 38 hours the third week. How many hours must he work in the fourth week if he wants to have worked on average 37 hours per week over all four weeks?

Write your answer in the form of a sentence.

let x = number of hours Jean-Paul worked the 4th week

$$\frac{35 + 42 + 38 + x}{4} = 37$$

$$\frac{x + 115}{4} = 37$$

$$x + 115 = 148$$

$$x = 33$$

Jean-Paul must work 33 hours the 4th week.

10. (3 points) You want to buy a table and four chairs for your new apartment for less than \$540. If the table costs \$220, what will be the cost of one chair?

Write your answer in the form of a sentence.

let x = cost of one chair

$$\text{table} + 4 \text{ chairs} < 540$$

$$220 + 4x < 540$$

$$4x < 320$$

$$x < 80$$

One chair will cost less than \$80.