

# Math 135 – Test 3: Version B

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  $-0.00078$  in scientific notation.  $-7.8 \times 10^{-4}$

missing - out front  $\left(-\frac{1}{2}\right)$   
 $-78$  at front  $\left(-\frac{1}{2}\right)$

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

(a)  $(-6pq^7)(-7p^5q^6)$

$42p^6q^{13}$

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

(b)  $(7 - 2b)^2$

$49 - 28b + 4b^2$

$(7-2b)(7-2b)$   
 $49 - 14b - 14b + 4b^2$   
 $49 - 28b + 4b^2$

(c)  $(8m + 1)(8m - 1)$

$64m^2 - 1$

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

$8^{2/3}$

any of  
 $\sqrt[3]{8^2}$  or  $(\sqrt[3]{8})^2$  or  $\sqrt[3]{64}$

no radical  $(-1)$

**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.

$$(3y - 2)(2y^2 - y + 4)$$

$$\underline{6y^3 - 7y^2 + 14y - 8}$$

$$(3y - 2)(2y^2 - y + 4)$$

$$6y^2 - 3y^2 + 12y - 4y^2 + 2y - 8$$

$$6y^3 - 7y^2 + 14y - 8$$

$$(3y - 2)(2y^2 - y + 4)$$

$$6y^3 - 4y^2 - 3y^2 + 2y + 12y - 8$$

$$6y^3 - 7y^2 + 14y - 8$$

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

$$\left(\frac{3^0 w^5 y^4}{2y^{-3}}\right)^{-2} = \left(\frac{w^5 y^7}{2}\right)^{-2}$$

$$= \frac{w^{-10} y^{-14}}{2^{-2}}$$

$$= \frac{2^2}{w^{10} y^{14}}$$

$$\underline{\frac{4}{w^{10} y^{14}}}$$

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

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

$$\begin{array}{r} x^2 + 5x + 10 \\ x - 2 \overline{) x^3 + 3x^2 + 0x - 16} \\ \underline{-(x^3 - 2x^2)} \phantom{-16} \\ 5x^2 + 0x \phantom{-16} \\ \underline{-(5x^2 - 10x)} \phantom{-16} \\ 10x - 16 \phantom{-16} \\ \underline{-(10x - 20)} \\ 4 \end{array}$$

$$\boxed{x^2 + 5x + 10 + \frac{4}{x - 2}}$$

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

(a) Three more than half a number

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

(b) Twice a number decreased by five

$$2x - 5$$

(c) The new price when the original price is reduced by 20%

$$0.8x$$

$$x - 0.2x$$

$$0.8x$$

8. (3 points) At his new job, Vijay worked 39 hours the first week, 41 hours the second week, and 35 hours the third week. How many hours must he work in the fourth week if he wants to have worked on average 38 hours per week over all four weeks?

Write your answer in the form of a sentence.

let  $x$  = number of hours Vijay worked the fourth week

$$\frac{39 + 41 + 35 + x}{4} = 38$$

$$\frac{x + 115}{4} = 38$$

$$x + 115 = 152$$

$$x = 37$$

Vijay must work 37 hours the fourth week.

9. (3 points) Heidi invested some money at 3% 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 Heidi invested

$$I = prt$$

$$45 = x(0.03)(3)$$

$$x = \frac{45}{(0.03)(3)}$$

$$= 500$$

Heidi invested \$500.

10. (3 points) You want to buy a table and six chairs for your new apartment for at least \$450. If the table costs \$210, what will be the cost of one chair?

Write your answer in the form of a sentence.

let  $x =$  cost of one chair

$$\text{table} + 6 \text{ chairs} > 450$$

$$210 + 6x > 450$$

$$6x > 240$$

$$x > 40$$

One chair will cost at least \$40.