

Math 100 Exam 1, Chapters 1 and 2

Name: Key

Student ID: _____

Instructions: Show your work and circle your answers

1. Use order of operations to find the value of the following. (4 points each)

a) $9 - (-3) + (-2)$
 $9 + 3 - 2 = 10$

b) $\frac{-4(8) - 3}{7(-5)}$
 $\frac{-32 - 3}{-35} = \frac{-35}{-35} = 1$

c) $18 \div 3 \cdot 6 + 2$
 $6 \cdot 6 + 2$
 $36 + 2 = 38$

d) $(-7 - 1)(-4) + (-4)$
 $(-8)(-4) + (-4)$
 $32 - 4 = 28$

2. Perform the indicated operations and reduce to lowest terms. (3 points each)

a) $\frac{5}{6} - \frac{7}{15}$
 $\frac{25}{30} - \frac{14}{30} = \frac{11}{30}$

b) $-\frac{9}{8} \cdot \frac{7}{3} \div \frac{5}{8}$
 $-\frac{9}{8} \cdot \frac{7}{3} \cdot \frac{8}{5}$
 $-\frac{21}{8} \cdot \frac{8}{5} = -\frac{21}{5}$
 $= -4\frac{1}{5}$

c) $2 + \left(-\frac{3}{4}\right)$
 $\frac{8}{4} + \left(-\frac{3}{4}\right)$
 $= \frac{5}{4}$

$\frac{5}{6} = \frac{25}{30}$
 $\frac{7}{15} = \frac{14}{30}$

3. Evaluate the algebraic expression if $x = -2$, $y = -4$, $z = 3$. (4 points each)

a) $x \cdot (3y - 4x)$

$$\begin{aligned} & -2(3(-4) - 4(-2)) \\ & -2(-12 + 8) \\ & -2(-4) = 8 \end{aligned}$$

b) $\frac{-z^2 + 5x}{-2y}$

$$\frac{-9 + 5(-2)}{-2(-4)} = \frac{-9 - 10}{8} = -\frac{19}{8}$$

4. Simplify. (4 points each)

a) $-4(k+2) + 3(2k-1)$

$$\begin{aligned} & -4k - 8 + 6k - 3 \\ & -4k + 6k - 8 - 3 \\ & \boxed{2k - 11} \end{aligned}$$

b) $-4[x - (3 - x)]$

$$\begin{aligned} & -4[x - 3 + x] \\ & -4[2x - 3] \\ & \boxed{-8x + 12} \end{aligned}$$

5. The width of a rectangle is 3 ft less than the length. The perimeter is 62 feet. Find the length and width of the rectangle. (5 points)

length = l

width = $w = l - 3$

$$l + l + l - 3 + l - 3 = 62$$

$$4l - 6 = 62$$

$$4l = 68$$

$$l = 17$$

$$w = 17 - 3 = 14$$

6. Solve each equation and CHECK your answer. (5 points each, 4 for solution, 1 for checking answer)

a) $-4x + 16 = -12$

$$\begin{array}{r} -4x = -28 \\ \hline -4 \quad -4 \end{array}$$

$$x = 7$$

$$-4(7) + 16 = -12$$

$$-28 + 16 = -12 \quad \checkmark$$

b) $3 - 2x = 9 - 8x$

$$\begin{array}{r} +2x \quad +2x \\ 3 = 9 - 6x \\ -9 \quad -9 \end{array}$$

$$\begin{array}{r} -6 = -6x \\ \hline -6 \quad -6 \\ 1 = x \end{array}$$

$$3 - 2(1) = 9 - 8(1)$$

$$1 = 1 \quad \checkmark$$

c) $3(8x - 1) = 6(5 + 4x)$

$$24x - 3 = 30 + 24x$$

$$-3 \neq 30$$

No solution

OR

\emptyset

d) $\frac{2x}{3} = \frac{x}{6} + 1$

$$6\left(\frac{2x}{3}\right) = 6\left(\frac{x}{6}\right) + 6(1)$$

$$4x = x + 6$$

$$-x \quad -x$$

$$3x = 6$$

$$x = 2$$

$$\frac{2 \cdot 2}{3} = \frac{2}{6} + 1$$

$$\frac{4}{3} = \frac{1}{3} + \frac{3}{3} = \frac{4}{3} \quad \checkmark$$

7. Solve the formula for B. (4 points)

$$A = \frac{B+C}{2} \Rightarrow 2A = B+C$$

$$\begin{array}{r} -C \quad -C \\ 2A - C = B \end{array}$$

8. Two buses leave a station at the same time, traveling in opposite directions. The rate of the faster bus exceeds that of the slower bus by 15 miles per hour. After 3 hours, they are 345 miles apart. What are the rates of the buses? (5 points)

Total distance = distance of bus

$$345 = 3x + 3(x+15)$$

$$345 = 3x + 3x + 45$$

$$\begin{array}{r} -45 \quad -45 \end{array}$$

$$\begin{array}{r} 300 = 6x \\ \hline 6 \quad 6 \end{array}$$

$$50_{\text{mph}} = x$$

$$65_{\text{mph}} = x + 15$$

$$r_1 = x$$

$$r_2 = x + 15$$

9. The product of 5 and a number, decreased by 9, is 306. What is the number? (5 points, show work!)

$$\begin{aligned}5x - 9 &= 306 \\5x &= 315 \\ \frac{5x}{5} &= \frac{315}{5} \\x &= 63\end{aligned}$$

10. Find three consecutive integers whose sum is 42. (5 points, you must write an equation and solve it to receive full credit!)

$$\begin{aligned}x + x + 1 + x + 2 &= 42 \\3x + 3 &= 42 \\ -3 & -3 \\3x &= 39 \\ \frac{3x}{3} &= \frac{39}{3} \\x &= 13\end{aligned}$$

13, 14, 15

11. Solve each inequality and put your solution in interval notation. (5 points each)

a) $6 + 9x \geq 33$

$$\begin{aligned}-6 & -6 \\+9x & \geq 27 \\x & \geq 3\end{aligned}$$

$[3, \infty)$

b) $4x - 2 > 2(x + 6)$

$$\begin{aligned}4x - 2 & > 2x + 12 \\ +2 & +2 \\4x & > 2x + 14 \\ -2x & -2x \\2x & > 14 \\x & > 7\end{aligned}$$

$(7, \infty)$

c) $-\frac{y}{3} + 1 > 4$

$$-\frac{y}{3} > 3$$

$$-y > 9$$

$$y < -9$$

$(-\infty, -9)$