Comparing Expressions

A. Fill in the Blanks

1. To compare 3x + 4 and 5x for x = 2, you must first _____ the value of x into each expression.
2. If Expression A evaluates to -8 and Expression B evaluates to -10, then Expression A is _____ than Expression B.
3. For n = 5, the expression 4(n-1) evaluates to _____, and 3n + 1 evaluates to _____, so the expressions are equal.
4. For any positive value of p, the expression p + 10 will always be greater than p + _____. (Use a number greater than 10). Example answer: 9
5. The three symbols used to compare the values of expressions are _____, _____, and _____.

B. Match the comparison problem in Column A with the correct symbol in Column B.

Column A	Column B
1. (2x + 3, 4x - 1) for x = 2	A. <
2. (10 - y, y + 4) for y = 3	B. >
3. (5(a - 1), 4a + 1) for a = 7	C. =
4. (z/3 + 1, z - 5) for z = 9	
5. (2k, k^2) for k = -3	

C. These problems include negative numbers, decimals, and more complex expressions.

1. For m = -3: 4m + 10 ☐ m - 2
2. For p = 0.5: 10p + 1 ☐ 6p + 3
3. For k = 8: (1/2)k + 5 ☐ k + 1
4. For y = -5: 2(y - 3) ☐ 3y
5. For x = 4: x^2 + 1 ☐ 5x - 3

D. Evaluate and compare the following expressions.

1. For x = 5: x + 7 ☐ 2x
2. For y = 3: 4y - 2 ☐ y + 8
3. For a = 10: a / 2 ☐ a - 5

4. For b = 4: 3(b + 1) ☐ 15

5. For z = 2: 20 - 3z ☐ 5z + 4

E. These problems require multi-step evaluation or algebraic reasoning.

1. For x = 3 and y = 4: 3x + 2y ☐ 2x + 3y

2. For k = -2: k^3 + 10 ☐ 5k

3. For what positive value of m are the two expressions equal? 4m + 2 and 2m + 10

4. Without substituting a value, compare the expressions for any value of a > 0: a + 100 ☐ a + 99 Explain your reasoning briefly.

5. For p = 6: (1/2)(p + 8) ☐ (1/3)(2p + 9)

F. Translate each scenario into two expressions and compare them.

1. Phone Plans: Plan A costs a flat fee of 20plus20plus0.10 per minute (m). Plan B costs 15plus15plus0.15 per minute (m). Which plan is cheaper for a call that lasts 80 minutes? Expression for Plan A: _____ Expression for Plan B: _____ Comparison for m = 80:
2. Car Rentals: Company A charges 40perdayplus40perdayplus0.25 per mile (d). Company B charges $60 per day with no mileage fee. Which company is cheaper for a 1-day trip of 50 miles? Expression for Company A: _____ Expression for Company B: _____ Comparison for d = 50:
3. Job Offers: Job A offers a 50signingbonusplus50signingbonusplus15 per hour (h). Job B offers $18 per hour (h) with no bonus. Which job pays more for 20 hours of work in the first week? Expression for Job A: _____ Expression for Job B: _____ Comparison for h = 20:
4. Party Venues: Venue A charges a 150rentalfeeplus150rentalfeeplus20 per guest (g). Venue B charges $25 per guest (g) with no rental fee. Which venue is more expensive for a party with 40 guests? Expression for Venue A: _____ Expression for Venue B: _____ Comparison for g = 40:
5. Temperature Models: Model A predicts the temperature will be T + 7 degrees, where T is the current temperature. Model B predicts 2T - 3 degrees. If the current temperature is T = 12 degrees, which model predicts a warmer temperature? Expression for Model A: _____ Expression for Model B: _____ Comparison for T = 12:

G. True or False

1. For x = 3, the expression 6x - 5 is greater than 2x + 8. _____
2. The expression a + 10 is always greater than the expression 2a. _____
3. When y = -4, 3(y + 2) is equal to 2y. _____
4. For k = 10, (1/2)k + 5 is less than k. _____
5. If m = 1, then m^2 + 4 is greater than 5m. _____