

YOUR NAME: _____

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Read each problem **very carefully** before starting to solve it. Each problem is worth 10 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. (a) Write in list notation and graph the set

$$\{x : x \text{ a whole number and } -2 \leq x < 7\}.$$

- (b) Find the following sets and write your answers in interval notation:

$$[1, \infty) \cap (-3, 5) =$$

$$[1, \infty) \cup (-3, 5) =$$

2. A rectangle has length that is 3 feet longer than twice its width. Its perimeter is 48 inches. Our task is to find its width.

- (a) Set a variable and state **precisely** what it stands for.

- (b) Write an equation that reflects the given data.

- (c) Solve the equation to complete the proposed task.

3. Cashews sell for \$7 per pound, whereas peanuts go for \$1.50 per pound. Our task is to determine how many pounds of cashews should be mixed with 2 pounds of peanuts so that the resulting delicious mixture is worth \$3 per pound.

(a) Introduce variable(s) and **precisely** explain their meaning.

(b) Write equation(s) that reflect the given data.

(c) Solve the equation(s) to find how many pounds of cashews we should get.

4. Solve the following absolute value inequality and write your answer in interval notation:

$$9 - 7|2x - 3| \leq -12$$

5. Find an equation for the line ℓ that passes through the point $(7, -1)$ and is perpendicular to the line ℓ' that passes through the points $(-23, -2)$ and $(2, 8)$.

(a) Outline your strategy in English:

Step 1:

Step 2:

Step 3:

(b) Carry out the steps you listed in Part (a) to find an equation for ℓ .