

(calculator free)

To obtain credit, you must show your work for each problem! Place a box around each answer.

1. [4 pts] Simplify fully:  $4(1 - 3(x - 11)) - 12(4 - x)$

**Solution:** Do not skip steps!

$$4(1 - 3(x - 11)) - 12(4 - x) =$$

$$4(1 - 3x + 33) - 12(4 - x) =$$

$$4(34 - 3x) - 12(4 - x) =$$

$$136 - 12x - 12(4 - x) =$$

$$136 - 12x - 38 + 12x =$$

**88**

*Quick check:* Let  $x = 0$ . Then  $4(1 - 3(x - 11)) - 12(4 - x) = 4(1 - 3(-11)) - 12(4) = 4(1 + 33) - 48 = 4(34) - 48 = 136 - 48 = 88$ .

2. [4 pts] Simplify fully:  $((3 + 4)^2 + 4) - 7 + 4^2$

**Solution:** Do not skip steps!

$$((3 + 4)^2 + 4) - 7 + 4^2 =$$

$$((7)^2 + 4) - 7 + 4^2 =$$

$$(49 + 4) - 7 + 4^2 =$$

$$(53) - 7 + 4^2 =$$

$$53 - 7 + 16 =$$

$$53 - 7 + 16 =$$

$$69 - 7 =$$

**62**

3. [4 pts] Let  $a = 3$ ,  $b = 1$ ,  $c = 0$ ,  $d = 4$ . Evaluate

$$\frac{a + 2b + 3c + 4d}{3 + 19abcd}$$

**Solution:** Using the fact that any multiple of 0 is 0:

$$\frac{a + 2b + 3c + 4d}{3 + 19abcd} =$$

$$\frac{3 + 2(1) + 3(0) + 4(4)}{3 + 19(3)(1)(0)(4)} =$$

$$\frac{3 + 2(1) + 4(4)}{3} =$$

$$\frac{3 + 2 + 16}{3} =$$

$$\frac{21}{3} =$$

$$7$$

4. [4 pts] Solve  $|x - 4| = 5$ .

**Solution:** Either  $x - 4 = 5$  or  $x - 4 = -5$ .

If  $x - 4 = 5$ , then  $x = 9$ . If  $x - 4 = -5$ , then  $x = -1$ .

We should check each solution to be certain it satisfies the given equation:

If  $x = 9$ , then  $|x - 4| = |9 - 4| = |5| = 5$ . So this checks.

If  $x = -1$ , then  $|x - 4| = |-1 - 4| = |-5| = 5$ . So this checks as well.

Hence the solutions to the given equation are  $x = 9$ ,  $x = -1$ .

5. [4 pts] If artichokes sell at 5 for 4 dollars how much will it cost (in dollars) to buy  $x$  artichokes?

**Solution:** One artichoke will cost  $4/5$  dollars. Thus the price of  $x$  artichokes is

$$\frac{4}{5}x \text{ dollars}$$



**EXTRA CREDIT** [4 pts] Simplify fully:  $8x - \{16y - [3x - (12y - x) - 8y] + x\}$

**Solution:** Do not skip steps!

Beginning from the innermost pair of parentheses:

$$8x - \{16y - [3x - (12y - x) - 8y] + x\} =$$

$$8x - \{16y - [3x - 12y + x - 8y] + x\} =$$

$$8x - \{16y - [3x - 12y + x - 8y] + x\} =$$

$$8x - \{16y - [4x - 20y] + x\} =$$

$$8x - \{16y - [4x - 20y] + x\} =$$

$$8x - \{16y - 4x + 20y + x\} =$$

$$8x - \{-3x + 36y\} =$$

$$8x + 3x - 36y =$$

$$\mathbf{11x - 36y}$$

