In problems 1-4 correctly use the order of operations to evaluate the given expression. (5 points each)

1. \[10 + 8 \div 2 - 4 \cdot 12\]

2. \[\left((-2) \cdot (-4)\right)^2 - (3 - 5)^3\]

3. \[\frac{4 - 2 \cdot 3}{4 + 9}\]

4. \[xy^2 - 2x^2\] when \(x = 3\) and \(y = -2\)

5. In problem 1 if we evaluate the expression by hand which of the following calculations would we do first? Circle the letter of the correct response. (3 points)
   (a) 10 + 8       (b) 8 ÷ 2       (c) 2 − 4       (d) 4 · 12
6. Indicate by letter what property of real numbers is illustrated by each of the following equations or statements. (1 point each)

(a) commutative property of addition
(b) associative property of addition
(c) additive identity property
(d) additive inverse property
(e) commutative property of multiplication
(f) associative property of multiplication
(g) multiplicative identity property
(h) multiplicative inverse property
(i) distributive property
(j) addition property of equality
(k) multiplication property of equality

_________ 3x \cdot 1 = 3x
_________ (x + 5) + 7 = x + (5 + 7)
_________ 6 + (–6) = 0
_________ 5(2x – 3) = 10x – 15
_________ If A = B then A + 5 = B + 5.
_________ \frac{3 \cdot 4}{4 \cdot 3} = 1
_________ 2 + 5x = 5x + 2
_________ \left( \frac{4 \cdot \frac{3}{5}}{20} \right) = 4 \cdot \left( \frac{3}{5} \cdot 20 \right)

7. Simplify the following polynomial expression. Show all necessary work. (5 points)

2(5x^2 – 5x + 7) – 3x(5x^3 – 3x^2 + 5x – 4)
In problems 8-10 solve the given equation for x. Show all necessary work. (6 points each)

8. \(3(x + 2) - 7 = 5 - 2(x + 7)\)

9. \(\frac{1}{3}x - \frac{3}{4} = \frac{1}{2} - 5x\)

10. \(5(x + 1.3) - 2.5 = 2.1 - 0.5x\)

11. Complete the following table of values dealing with the length, width, perimeter, and area of a rectangle. (2 points per blank)

<table>
<thead>
<tr>
<th>Length ((\ell))</th>
<th>Width ((w))</th>
<th>Perimeter ((P = 2\ell + 2w))</th>
<th>Area ((A = \ell w))</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 cm</td>
<td>4 cm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.8 cm</td>
<td>1.2 cm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 cm</td>
<td></td>
<td></td>
<td>30 sq cm</td>
</tr>
<tr>
<td>22 cm</td>
<td>74 cm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
12. The length of a rectangle is two inches more than four times its width. The perimeter of the rectangle is fifty-four inches. Set up and solve an appropriate equation to determine the length and width of the rectangle. (8 points)

13. Two cars leave the same place at the same time travelling in opposite directions. The red car is travelling at a speed that is 12 miles per hour more than the blue car’s speed. After five hours the two cars are 450 miles apart.

(a) Complete the following table. (5 points)

<table>
<thead>
<tr>
<th></th>
<th>Rate</th>
<th>Time</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Car</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue Car</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(b) Set up and solve an equation to find x. (6 points)

(c) What is the speed for the blue car? (3 points)
14. Let \( U = \left\{ -\frac{1}{4}, \sqrt{3}, \pi, -4, 0, \sqrt{36}, 4.58 \right\} \). List the elements in each of the following sets.

(2 points each)

a) \( A = \left\{ x \in U \mid x \text{ is a whole number} \right\} \)

b) \( B = \left\{ x \in U \mid x > 0 \right\} \)

c) \( A \cap B \)

d) \( A' \)