Objective #1: Master Order of Operations (Understand misleading nature of “PEMDAS”)
Objective #2: Simplify expressions involving Integer Exponents
Objective #3: Evaluate formulas, expressions and functions

Order of Operations
Step 1: Grouping Symbols: \[(     )\], \(\sqrt{}\), \(|ab.\ value|\) “inside-out”
Step 2: Exponents
Step 3: Multiplication/division Left → Right
Step 4: Addition/subtraction Left → Right

Example 1
15 – 7\[−1 – (2 – 5)^2\]
15 – 7\[−1 – (−3)^2\]
15 – 7\[−1\ − 9\]
15 – 7\[−10\]
15 + 70
85

Example 2
−40 ÷ 23(5) + 20
−40 ÷ 8(5) + 20
−5(5) + 20
−25 + 20
−5

Example 3
−6[3 – 7]−5\sqrt{100} – 36
−6|4| − 5\sqrt{64}
−6(4) − 5(8)
−24 – 40
−64

I. Perform the operations - no calculator! Simplify completely.

1) \((-16) – (+8) + 9 – (4 – 10)\)
2) \(-6 – (−13) + (−11) – (+7)\)
3) \(7 + 8 – 2[4 – 2(5)]\)
4) \(7 + 2\sqrt{16} + 9\)
5) \(-32 ÷ 4 \cdot 2^3 – 6\)
6) \(\frac{2 + 4 \cdot 6}{-12 – 6}\)
7) \(-9\ − |−2| + |5|\)
8) \(|8 – 5| – |1 – 7|\)
9) \(\frac{|1 – 3^2|}{|−2 + 14 – 6|}\)
10) \((7 – 2)^2 – (−6)^2 + 1^4\)
11) \(-5^2 – 8 \cdot 5^0 + 5^1\)
12) \((5^2 – 3^3)^4\)
13) \(\sqrt{5^2 – 4^2} – \sqrt{5^2 \cdot 4^2}\)
14) \(6 – (−2)^3\)
15) \(6(−2)^3\)
16) \(\frac{5}{16} \cdot \frac{5}{16}\)
17) \([-12 + 20 + 7 – 11]\)
18) \(2 – \frac{4 + 5}{7 + 2}\)
19) \(3 + \frac{5}{6} – \frac{11}{4}\)
20) \(\frac{−15(8)}{25} \cdot \frac{−35}{−21}\)
21) \(\frac{12}{5} \cdot \frac{9}{10} \cdot \frac{15}{4}\)
22) $4 \frac{1}{3} \div 26$  
23) $-18 \div 6 \frac{3}{4}$  
24) $1 \frac{7}{18} \div 3 \frac{8}{9}$  
25) $\frac{2^3 + 2^2 - 2^1}{8\sqrt{9}}$

26) $5^3 \cdot 10^{-2}$  
27) $(-6)^{-2} \cdot 3^3$  
28) $\frac{5}{-3^2}$  
29) $\frac{(-2)^4}{3}$

30) $\frac{10^2}{4^3}$  
31) $\frac{-9 \cdot 12^{-1}}{4^3}$  
32) $2^{-3} - 2^{-2} + 2^{-1}$

33) $3 \cdot 2^{-4} - 7 \cdot 8^{-1}$

34) $6 \cdot 5^{-1} + 5^2 \cdot 2^3$

35) $(6^{-1} - 3^{-2})^{-1}$  
36) $(8^{-1} + 2^{-2})^{-2}$  
37) $2^{-3} - 15 \cdot 6^{-2}$

38) $(-1)^6 - 6\sqrt{25 - 16}$  
39) $\frac{-8 + \sqrt{8^2 - 4(-1)(-15)}}{2(-1)}$  
40) $\frac{-(6) + \sqrt{(-6)^2 - 4(1)(-7)}}{2(1)}$

41) $\frac{-5 + \sqrt{5^2 - 4(1)(-14)}}{2(1)}$  
42) $\frac{2 - \sqrt{(-2)^2 - 4(2)(-12)}}{2(2)}$  
43) $\frac{-(1) - \sqrt{(-1)^2 - 4(3)(-4)}}{2(3)}$

II. $a, b$: Evaluate each formula or expression at the given value(s). For $c$, solve for unknown value.

1) $F = \frac{9}{5} C + 32$;  
a) $C = 30$  
b) $C = -15$  
c) $F = 50$

2) $C = \frac{5}{9}(F - 32)$;  
a) $F = -31$  
b) $F = 104$  
c) $C = -25$

3) $K = \frac{1}{2} m v^2$;  
a) $m = 12; \ v = 5$  
b) $m = 20; \ v = -8$  
c) $K = 90; \ v = 6$

4) $S = \frac{a^5 - 1}{a - 1}$;  
a) $a = 4; \ n = 3$  
b) $a = -2; \ n = 4$

5) $x^3 y z^2$;  
a) $x = -2; \ y = 3; \ z = -1$  
b) $x = 3; \ y = 5; \ z = - \frac{2}{5}$

6) $\frac{6y - z^2}{xy}$  
a) $x = -2; \ y = 3; \ z = -4$  
b) $x = 6; \ y = -4; \ z = 2$

III. Evaluate each function at the given value; write result as an (Ordered, Pair).

1) $g(x) = 12x - 5; \ x = \frac{7}{4}$  
5) $h(x) = 5x - x^2 + 2.32; \ x = -0.3$

2) $r(t) = -\frac{7}{5} t + 2; \ t = 6$  
6) $h(x) = x^3 - 2x^2; \ x = -2$

3) $f(x) = 1.4x + 0.657; \ x = 0.4$  
7) $f(x) = -6x^2 + 7x - 1; \ x = -\frac{3}{2}$

4) $f(x) = x^2 - 4x - 11; \ x = -3$  
8) $h(x) = x^2 \sqrt{1 - 2x}; \ x = -4$
IV. Simplify: express answer with positive exponents.

a) \(-6a^{-4}b^0\)  
b) \(8x^{-4}yz^{-2}\)  
c) \((-n^6)^3\)  
d) \((-n^3)^6\)  
e) \((-n^4)^{-5}\)  
f) \((-n^{-6})^{-3}\)  
g) \((2n^{-6})^3\)

h) \(-\frac{10}{26p^{-1}}\)

i) \(-\frac{12pm^{-1}}{4pm}\)

j) \(-\frac{25a^3b^6c}{35a^3b^2c^3}\)

k) \(-\frac{n^2w^6}{n^3w^4}\)

l) \(-\frac{7k^3m^{-5}}{-35k^2m^4}\)

m) \(-4a^{-3}b^{-5}c(-9a^3b^2c^4)\)

n) \(3x^{-4}w^{-3}z(-7x^{10}w^3z^{-6})\)

o) \((-10a^2b^{-4})^2\)

p) \((-3x^4y^{-5})^{-3}\)

q) \(-12a^{-2}b^8(-2a^{-3}b^9)^{-2}\)

Topic 2: Place Value, Rounding, Fractions

Objective #1: Identify place-value by name and “exponential equivalent”

Objective #2: Express numbers in written form; round numbers

Objective #3: Perform operations with fractions

I. a) Place Value name; b) Values in decimal form; c) Values in fraction form; d) Values in 10^n form

a) _____________   ____________   _________    __________   ______________    ______________

II. a) Round 1,752,493 to the nearest:

b) Round 8.60524 to the nearest:

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III. Express each number in written form.

Examples:

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<th>Acceptable</th>
<th>Unacceptable</th>
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<tr>
<td>a) 0.062</td>
<td>sixty-two thousandths</td>
<td>point zero, six, two</td>
</tr>
<tr>
<td>b) 2.15</td>
<td>two and fifteen hundredths</td>
<td>two point fifteen</td>
</tr>
<tr>
<td>c) 74.0502</td>
<td>seventy-four and five hundred two ten-thousandths</td>
<td>- - - -</td>
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</tbody>
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1) 0.9008  
2) 12.7  
3) 5.91  
4) 0.654  
5) 43.02  
6) 0.00035  
7) 0.7426  
8) 0.085309

IV. Simplify the following fractions.
1) \(\frac{35}{56}\)  
2) \(\frac{540}{360}\)  
3) \(\frac{90}{75}\)  
4) \(\frac{72}{56}\)  
5) \(\frac{60}{108}\)  
6) \(\frac{840}{6300}\)

V. Write each improper fraction as a simplified mixed number, e.g., \(\frac{28}{33} = 9\frac{1}{3}\)
1) \(\frac{34}{5}\)  
2) \(\frac{54}{11}\)  
3) \(\frac{115}{12}\)  
4) \(\frac{72}{56}\)  
5) \(\frac{95}{8}\)  
6) \(\frac{131}{24}\)

VI. Perform the operations; simplify.
1) \(3\frac{1}{8} \cdot \frac{24}{40}\)  
2) \(-\frac{64}{25} \div 2\frac{2}{15}\)  
3) \(\frac{125}{81} + \frac{74}{90}\)  
4) \(-2\frac{7}{16}(-\frac{19}{18})\)  
5) \(5\frac{1}{3} + 2\frac{6}{7}\)  
6) \(8 \cdot \frac{11}{12} \cdot \frac{34}{60}\)

7) \(\frac{10}{8} - \frac{7}{8}\)  
8) \(3\frac{1}{8} + 2\frac{7}{8}\)  
9) \(6 - 2\frac{5}{9}\)  
10) \(3\frac{1}{4} + 1\frac{2}{3}\)  
11) \(\frac{8}{15} + \frac{7}{10}\)  
12) \(\frac{17}{18} - \frac{11}{12}\)

13) \(\frac{8}{12} + \frac{7}{12}\)  
14) \(1\frac{4}{5} - \frac{8}{9}\)  
15) \(\frac{35}{72}(-\frac{24}{60})\)  
16) \(2\frac{1}{15} - 4\frac{3}{10}\)  
17) \(\frac{19}{30} - \frac{12}{20}\)  
18) \(\frac{17}{60} - \frac{11}{40}\)

19) \(\frac{22}{15} + \frac{7}{40}\)  
20) \(\frac{2}{15} - \frac{1}{50}\)  
21) \(3\frac{1}{4} + 1\frac{1}{2}\)  
22) \(4\frac{8}{15} - 5\)  
23) \(2\frac{4}{9} - 3\frac{1}{6}\)  
24) \(12(2\frac{5}{6})\)

25) \(2 + \frac{3}{4} - \frac{8}{10}\)  
26) \(\frac{5}{6} - \frac{2}{6} + \frac{1}{4}\)  
27) \(3 - \frac{1}{8} + \frac{5}{12}\)  
28) \((-\frac{3}{2})^2 + 3\)  
29) \((1-\frac{1}{4})^2 - \frac{5}{6}\)  
30) \((-\frac{1}{4})^2 - (-\frac{1}{2})^2\)

VII. Determine the unknown part of each circle.

1)  
2)  
3)  
4)  
5)  
6)
Topic 3: Fractions, Decimals, % and Scientific Notation

**Objective #1:** Improve computational skills with fractions, decimals and per cents
**Objective #2:** Develop “mental math” skills and number sense
**Objective #3:** Convert numbers to Scientific Notation/Standard forms

I. Determine the unknown part of each circle.

1) ![Circle 1](image1)
2) ![Circle 2](image2)
3) ![Circle 3](image3)
4) ![Circle 4](image4)
5) ![Circle 5](image5)
6) ![Circle 6](image6)

II. Perform the operations; simplify.

1) \(3.708 + 0.56\)  
2) \(-3.708 - 0.56\)  
3) \(-3.708 + 0.56\)  
4) \(3.708 - 0.56\)  
5) \(1.2 - 0.12 + 0.012\)  
6) \(1.2 - 0.12 - 0.012\)  
7) \(-1.2 - 0.12 + 0.012\)  
8) \(-1.2 + 0.12 - 0.012\)  
9) \(3.2 + (-0.3)^2\)  
10) \(3.2 - (-0.3)^2\)  
11) \((-0.4)^3 - 2.351\)  
12) \((1.2)^2 - (1 - 0.9)^2\)  
13) \(4(1.3) - (4.2 - 5)^2\)  
14) \(3(1 - 0.48) - (0.5)^3\)  
15) \((0.2)^3 - 1.2(0.1)^2\)  
16) \((0.5)^3 - (0.5)^2 + (0.5)^0\)

III. “Divide” by moving the decimal point(s), then simplifying fraction. (Do **not** use long division.)

1) \(\frac{2.7}{6}\)  
2) \(\frac{1}{0.32}\)  
3) \(\frac{0.12}{0.8}\)  
4) \(\frac{2.7}{6}\)  
5) \(\frac{0.54}{0.036}\)  
6) \(\frac{0.00045}{0.008}\)  
7) \(\frac{61}{3.4}\)

IV. Express each fraction as a **decimal** and a **per cent**.

1) \(\frac{67}{100}\)  
2) \(\frac{863}{100}\)  
3) \(\frac{7}{4}\)  
4) \(\frac{7}{5}\)  
5) \(\frac{39}{50}\)  
6) \(\frac{12}{8}\)  
7) \(\frac{2}{25}\)  
8) \(\frac{17}{25}\)  
9) \(\frac{23}{10,000}\)  
10) \(\frac{38}{50}\)

V. Express each decimal as a **per cent** and a **simplified fraction**.

1) 0.6  
2) 0.85  
3) 3.04  
4) 9.26  
5) 2.9  
6) 11.5  
7) 0.02  
8) 0.802  
9) 0.0005  
10) 0.048
VI. Express each per cent as a decimal and as a simplified fraction.

1) 24%   2) 700%   3) 5%   4) 1.234%   5) 0.6%
6) 1.5%   7) 325%   8) 750%   9) 0.08%   10) 12.9%
11) 9 \frac{1}{2}\%   12) \frac{3}{4}\%   13) 2 \frac{4}{5}\%   14) \frac{38}{50}\%   15) 3 \frac{1}{2}\%

VII. Express each per cent as a simplified fraction. (Hint: Avoid long division)

1) 8 \frac{1}{2}\%   2) 5 \frac{5}{9}\%   3) 7 \frac{1}{2}\%   4) 3 \frac{7}{11}\%   5) 4 \frac{3}{8}\%

VIII. **Mental Math** – Find the following without a calculator. Look for patterns.

1. a) 100% of 245 lbs.   b) 10% of 245 lbs.   c) 1% of 245 lbs.
2. a) 100% of $9,675   b) 10% of $9,675   c) 1% of $9,675
3. a) 10% of 15 feet   b) 20% of 15 feet   c) 300% of 15 feet
4. a) 10% of 218 cm   b) 2% of 218 cm   c) 0.1% of 218 cm
5. a) 1% of 38,000 students   b) 40% of 38,000 students   c) 0.5% of 38,000 students
6. a) 10% of $84.60   b) 5% of $84.60   c) 15% of $84.60
7. a) 10% of $140.80   b) 5% of $140.80   c) 15% of $140.80

IX. Convert to Scientific Notation. **Round** answers to nearest hundredth.

Example: 0.000013682 is written as $1.37 \times 10^{-5}$.

1) 34,600,000   2) 512,400   3) 7,777   4) 432   5) 54,675   6) 0.008655
7) 0.61   8) 0.000002348   9) 0.00094321   10) –25.8   11) 0.0354821   12) 2,951.827

X. Convert to standard form.

1) 1.55 \times 10^2   2) 8.25 \times 10^6   3) –49.08 \times 10^{-1}   4) 0.094 \times 10^5
5) 3.45 \times 10^{-4}   6) 7.94 \times 10^{-3}   7) 789.5 \times 10^{-2}   8) 20 \times 10^3

XI. Perform the operations. Write answers in Scientific Notation, rounded to nearest hundredth.

1) \( (4.62 \times 10^{-8}) + (2.75 \times 10^{-8}) \)   2) \( (5.9 \times 10^5) + (1.68 \times 10^5) \)   3) \( (7.64 \times 10^{-7}) - (5.8 \times 10^{-7}) \)
4) \( (8 \times 10^{12}) - (3.4 \times 10^{12}) \)   5) \( (2.37 \times 10^6) \cdot (3 \times 10^{-8}) \)   6) \( (-1.4 \times 10^{-3}) \cdot (5.2 \times 10^{-4}) \)
7) \( (2.3 \times 10^{-7})^2 \)   8) \( (-1.9 \times 10^{36})^2 \)   9) \( \frac{9.4 \times 10^{21}}{4 \times 10^{-6}} \)   10) \( \frac{6.7 \times 10^{-9}}{5 \times 10^{5}} \)

XII. True or False

a) \( (2^3)^{-3} = 1 \)   b) \( (2^4 + 2^4)^{-1} = 2^{-4} + 2^{-4} \)   c) \( 3^{-2} \cdot 4^{-2} = 12^{-2} \)   d) \( -8^0 + 8^0 = 0 \)
e) \( -3 \cdot 9^{-1} = \frac{1}{27} \)   f) \( (-2^3)^3 = -64 \)   g) \( 9^2 - 4^2 = 5^2 \)   h) \( (10^2 \cdot 5^{-3})^{-1} = \frac{5}{4} \)
Topic 4: Applications to Fractions, Decimals, and %

**Suggestion:** In problems 1, 2, 4, and 5, organize the given information into a chart, diagram, etc.

1) At a school of 38 students, 20 are girls. Ten of the 16 students who play hockey are boys.
   a) How many boys attend the school? ______
   b) How many girls play hockey? ______
   c) How many students do not play hockey? ______
   d) What simplified fraction of the hockey players are girls? ______
   e) What simplified fraction of the girls plays hockey? ______
   f) What simplified fraction of the boys plays hockey? ______
   g) What % of the girls plays hockey? ______

2) In a business of 40 employees, 16 are men. Eight of the 18 employees that are accountants are women.
   a) How many women work in the office? ______
   b) How many male accountants are there? ______
   c) What simplified fraction of the employees is male? ______
   d) What simplified fraction of the accountants is female? ______
   e) What % of the employees works in accounting? ______
   f) What % of the men does not work in accounting? ______

3) Fifty people were asked to name their favorite ice cream. The results of the survey are below.

```
Chocolate, 46%
Strawberry, 20%
Vanilla, 24%
Other
```
   a) What % chose “Other”? ______
   b) What simplified fraction named strawberry? ______
   c) What simplified fraction chose vanilla? ______
   d) How many selected: vanilla? ______
       chocolate? ______

4) A sports club has 60 members, 35% of whom surf. Two-thirds of the surfers snow board; 13 other club members also snow board.
   a) How many of the club members surf? ______
   b) What simplified fraction of the members does not surf? ______
   c) How many of the surfers snow board? ______
   d) What simplified fraction of the members does not snowboard? ______
   e) What % of the members snow boards? ______

5) Malin polled a group of 75 students. Her findings: 60% of the students had registered to vote; eight-fifteenths of the students support the Democratic candidate, and 17 of the supporters of the Democrat are male.
   a) How many of the students are registered to vote? ______
   b) What simplified fraction of the students is registered to vote? ______
   c) What % of the students is not registered to vote? ______
   d) How many of the students prefer the Democratic candidate? ______
   e) What simplified fraction of the students do not prefer the Democrat? ______
   f) How many of the supporters of the Democrat are female? ______
   g) What % of the supporters of the Democrat are male? ______
   h) What % of the supporters of the Democrat are female? ______
**Topic 5: Expressions, Equations, Formulas**

**Objective #1:** Determine whether an expression or equation

**Objective #2:** Simplify expressions; solve equations

**Objective #3:** Solve a formula for the indicated variable.

**I. Classify as expression/equation; simplify/solve, as appropriate.**

1. a) \(2n - 11 - 3n - 7\)  
   b) \(2n - 11 = -3n - 7\)
2. a) \((5a - 1) - (6 - 2a) = a + 5\)  
   b) \((5a - 1) - (6 - 2a) + a + 5\)
3. a) \(c - \frac{5}{13}c + 10 = -18\)  
   b) \(c - \frac{5}{13}c + 10 = -18\)
4. a) \(\frac{1}{2}a + \frac{5}{6} - \frac{1}{6} - \frac{3}{4}a\)  
   b) \(-\frac{1}{3}a + \frac{5}{6} = \frac{1}{6} - \frac{3}{4}a\)
5. a) \(y - \frac{2}{10}y = \frac{11}{15}y + \frac{1}{6}\)  
   b) \(y - \frac{2}{10}y - \frac{11}{15}y - \frac{1}{6}\)
6. a) \(0.24p - 0.06p + 1 - 0.2\)  
   b) \(0.24p - 0.06p + 1 = -0.2\)
7. a) \(r - 5.1 - 1.2 + 0.82r\)  
   b) \(r - 5.1 = 1.2 + 0.82r\)
8. a) \(0.2(3x + 4) = 3.2 - x\)  
   b) \(0.2(3x + 4) - 3.2 - x\)
9. a) \(0.2y - 0.06y - 3 = 1.2\)  
   b) \(0.2y - 0.06y - 3 + 1.2\)

**II. Simplify the expressions; solve the equations.**

1) \(y - 0.4y\)  
   2) \(\frac{b}{2.1} = 0.4\)  
   3) \(0.12k = 0.009\)  
   4) \(\frac{4}{3}[w + (5w - 9)]\)
5) \(-2[4 - 6(n - 3)] = -20\)  
   6) \(\frac{5y}{36} = \frac{45}{60}\)  
   7) \(\frac{7}{10}m^3 - \frac{1}{15}m^3\)  
   8) \(3v - \frac{9}{8} = 8v - \frac{9}{8}\)
9) \((7r - r + 1) - (3r + 10) = 0\)  
   10) \(-\frac{2}{9}n = -40\)  
   11) \(\frac{3c}{8} + \frac{1}{2} - \frac{5c}{12} = -\frac{2}{3}\)  
   12) \(0.3r - 0.19r = 2.4 - 8.5\)
13) \(-24(-\frac{3}{8}n^2) + 3(-2n + 5n^2)\)  
   14) \(9n + 4 - n - 8 = 5 - \frac{1}{3}(9 - 15n)\)  
   15) \(y - 0.4y = 0.42\)
16) \((5 - 3c)d - d(7c + 2)\)  
   17) \(\frac{3c}{8} + \frac{1}{2} = \frac{5c}{12} - \frac{2}{3}\)  
   18) \(\frac{3}{7}y + 9 = \frac{1}{7}y - 3\)  
   19) \(7y - \frac{2xy}{9} + \frac{7xy}{12} = 15y\)
20) \(0.4r + 2r - 0.02 = -0.08\)  
   21) \((5y - 2)4y - (3 - 2y)(4y + 1)\)  
   22) \((a - 2b)^2 - a(3a - 5b)\)

**III. Solve for the indicated variable.**

1) \(y = mx + b; \ x\)  
   2) \(2L + 2W = P; \ W\)  
   3) \(V = \frac{1}{2}Ah; \ A\)  
   4) \(aS - S = a^n - 1; \ S\)
5) \(m = \frac{y - y_1}{x - x_1}; \ y\)  
   6) \(K = \frac{1}{2}mv^2; \ m\)  
   7) \(PRT = A - P; \ P\)  
   8) \(L = \frac{ab + c}{n}; \ b\)
Objective: Develop a structured approach for solving “comparison” application problems

1. The length of a rectangular garden is four feet longer than the width. The garden’s perimeter is 28 feet.
   a) Express in terms of \( x \): width = ____________ length = ____________
   b) Write an equation; solve.
   c) Find the dimensions of the garden; use correct units.

2. A piggy bank contains 52 coins, all nickels and quarters. There are three times as many nickels in the bank as quarters.
   a) Express in terms of \( x \): # nickels = ____________ # quarters = ____________
   b) Write an equation; solve.
   c) Find the number of nickels and the number of quarters in the bank.

3. A piggy bank contains 66 coins, all dimes and pennies. The number of dimes in the bank is three more than one-half the number of pennies.
   a) Express in terms of \( x \): # pennies = ____________ # dimes = ____________
   b) Write an equation; solve.
   c) Find the number of pennies and the number of dimes in the bank.

4. The number of girls in a certain first grade class is five less than twice the number of boys; there are 28 students in the class.
   a) Express in terms of \( x \): # girls = ____________ # boys = ____________
   b) Write an equation; solve.
   c) Find the number of boys and girls in the class, respectively.

5. The number of boys at a basketball camp is four less than three-halves the number of girls in attendance; 61 children attend this camp.
   a) Express in terms of \( x \): # girls = ____________ # boys = ____________
   b) Write an equation; solve.
   c) Find the number of boys and girls at the camp, respectively.

6. The largest angle in a triangle is twice the measure of the smallest angle, while the other angle is eight degrees larger than the smallest angle.
   a) Express in terms of \( x \): smallest \( \angle \) = ____________ other \( \angle \) = ____________ largest \( \angle \) = ____________
   b) Write an equation; solve.
   c) Find the measure of each angle.

7. The smaller of two complementary angles is 10 degrees more than one-third the measure of the larger angle.
   a) Express in terms of \( x \): smaller \( \angle \) = ____________ larger \( \angle \) = ____________
   b) Write an equation; solve.
   c) Find the measure of each angle.

8. The larger of two supplementary angles is 25 degrees less than four times the measure of the smaller angle.
   a) Express in terms of \( x \): smaller \( \angle \) = ____________ larger \( \angle \) = ____________
   b) Write an equation; solve.
   c) Find the measure of each angle.
Topic 7: Lines

**Objective #1:** Graph a line using slope and $y$-intercept

**Objective #2:** Determine a line’s slope, $x$- and $y$-intercepts

**Objective #3:** Find the equation of a line in $y = mx + b$ form

**Objective #4:** Identify/manipulate Slope-Intercept, Point-Slope and Standard forms

I. a) Graph all five lines on the given xy-plane. **Use a straight-edge! Label!**
   b) Identify slope of each line.
   c) Find each line’s $x$- and $y$-intercepts, when possible; write as (Ordered, Pairs).

A: $y = \frac{4}{3}x - 4$   slope = ________________
   x-int.: ( , ); y-int.: ( , )

B: $y = -3x$   slope = ________________
   x-int.: ( , ); y-int.: ( , )

C: $x = -3$   slope = ________________
   x-int.: ( , ); y-int.: ( , )

D: $y = -x + 5$   slope = ________________
   x-int.: ( , ); y-int.: ( , )

E: $y = 2$   slope = ________________
   x-int.: ( , ); y-int.: ( , )

II. a) Write the line in slope-intercept form, $y = mx + b$.
   b) Find the $x$- and $y$-intercepts; write as (Ordered, Pairs).
   c) Graph the line.

1) $6x - 4y = 12$  
2) $18x + 9y = 27$  
3) $y + 3 = -\frac{1}{4}(x - 8)$  
4) $4x - \frac{2}{3}y = 0$

III. Given a line’s slope and a point on the line, find the equation of the line in $y = mx + b$ form.

1. $m = 6$; point: $(2, 3)$  
2. $m = -\frac{2}{3}$; point: $(-12, -5)$  
3. $m = -3.2$; point: $(-2, 7)$  
4. $m = 0$; point: $(1, -2)$  
5. $m = \frac{7}{6}$; point: $(-3, 5)$  
6. $m = -\frac{2}{3}$; point: $(4, 1)$

IV. Given two points, find the equation of the line in $y = mx + b$ form.

1. $(0, 4), (7, 0)$  
2. $(2, 3), (4, -3)$  
3. $(-3, 8), (1, 4)$  
4. $(-3, -1), (6, 5)$  
5. $(-2, -3), (1, 2)$  
6. $(-6, 4), (-2, 1)$  
7. $(1, 2.4), (4, 7.2)$  
8. $(2, 15.6), (6, 8)$

V. Write in $Ax + By = C$ form, where $A$, $B$ and $C$ are Integers.

1. $y = -\frac{1}{3}x - 2$  
2. $y = -\frac{2}{3}x - 6$  
3. $y = \frac{5}{4}x + \frac{1}{6}$  
4. $y = 1.5x + 2.9$
5. $y = -0.52x + 0.8$  
6. $y - 2 = -\frac{4}{3}(x - 10)$  
7. $y + 5 = \frac{8}{3}(x + 2)$  
8. $y - 1 = -\frac{2}{3}(x + 3)$