1. Add or subtract as indicated. Reduce when possible.
   a) \( \frac{6}{5} + \frac{7}{5} \)
   b) \( \frac{11}{6} - \frac{1}{2} + \frac{2}{3} \)
   c) \( \frac{4b}{x} - \frac{9b}{x} \)

2. Multiply or divide as indicated. Reduce when possible.
   a) \( \frac{16}{5} \div \frac{8}{3} \)
   b) \( \frac{x}{3} \cdot \frac{5}{4} \div \frac{x}{4} \)
   c) \( \frac{1}{3} \div \frac{1}{4} \div \frac{1}{6} \)
3. Simplify as much as possible. Follow the order of operations.

\[
a) \ 2 - \frac{1}{4} \div \left( -\frac{1}{12} \right) \\
b) \ 2 + \frac{1}{9} \div \left( \frac{1}{3} \right)^3
\]

4. Find the value of each expression when \( x = 3 \). Reduce when possible.

\[
a) \ 2x^2 - 3x + 1 \\
b) \ \frac{x}{3} - \frac{1}{3x}
\]
5. Reduce the following fractions to their lowest terms.
   a) \( \frac{35 x^3 y z^2}{5 x^2 z} \)  
   b) \( \frac{24 x^2 y^5 z^2}{4 y^2 z^6} \)

6. Simplify the expressions below as much as possible.
   a) \( \left( \frac{3}{4} - \frac{7}{16} \right)^2 \)
   b) \( \left( \frac{3}{2} - \frac{7}{8} \right)^2 - \frac{3}{4} \)
7. Solve for x:

a) $3x - 7 = 18$

b) $3x - 5 = -2$

c) $\frac{3}{4}x - \frac{2}{3} = \frac{1}{3} + \frac{3}{2}$

d) $\frac{3}{4}x - \frac{1}{2}x = \frac{1}{10} + \frac{1}{5}$
8. Write each decimal as a fraction.
   a) 0.17
   b) 0.012
   c) 0.00123
   d) 0.030075

9. Write each word statement as a decimal number.
   a) Twenty-seven one-thousandths
   b) Negative three and nine ten-millionths
   c) Sixty-four and twenty-three hundredths
   d) Five thousand five and seven hundred-thousandths
10. Answer the following questions.

a) Find the **Perimeter** for the shape below.

b) Find the **Area** for the shape below. \( A = bh \)

11. Find the **volume** and **surface area** of the shape below.

\[
V = lwh \\
SA = 2lw + 2lh + 2wh
\]
Math351
Practice Exam #02

1. Add or subtract as indicated. Reduce when possible.
   a) \( \frac{6}{5} + \frac{7}{5} \)  
   \[ \frac{6+7}{5} = \frac{13}{5} \]
   
   b) \( \frac{11}{6} - \frac{1}{2} + \frac{2}{3} \)  
   \[ \frac{11}{6} - \frac{1}{2} \left( \frac{3}{3} \right) + \frac{2}{3} \left( \frac{2}{2} \right) \]  
   \[ = \frac{11}{6} - \frac{3}{6} + \frac{4}{6} \]  
   \[ = \frac{11-3+4}{6} \]  
   \[ = \frac{12}{6} \]  
   \[ = 2 \]

2. Multiply or divide as indicated. Reduce when possible.
   a) \( \frac{16}{5} \div \frac{8}{3} \)  
   \[ \frac{16}{5} \cdot \frac{3}{8} \]  
   \[ = \frac{6}{5} \]
   
   b) \( \frac{x}{3} \cdot \frac{5}{4} \div \frac{x}{4} \)  
   \[ \frac{x}{3} \cdot \frac{5}{4} \cdot \frac{4}{x} \]  
   \[ = \frac{5}{3} \]
   
   c) \( \frac{1}{3} \div \frac{1}{4} \div \frac{1}{6} \)  
   \[ = \frac{1}{3} \cdot \frac{4}{1} \cdot \frac{6}{1} \]  
   \[ = \frac{8}{1} \]  
   \[ = 8 \]
3. Simplify as much as possible. Follow the order of operations.

   a) \(2 - \frac{1}{4} \div \left( -\frac{1}{12} \right)\)
   
   \(2 - \frac{1}{4} \cdot \left( -\frac{12}{4} \right)\)
   
   \(2 - \left( -\frac{12}{4} \right)\)
   
   \(2 - (-3)\)
   
   \(2 + 3\)
   
   \[5\]

   b) \(2 + \frac{1}{9} \div \left( \frac{1}{3} \right)^3\)
   
   \(2 + \frac{1}{9} \div \frac{1}{27}\)
   
   \(2 + \frac{1}{9} \cdot \frac{27}{1}\)
   
   \(2 + \frac{1}{9} \cdot \frac{3}{1}\)
   
   \(2 + 3\)
   
   \[5\]

4. Find the value of each expression when \(x = 3\). Reduce when possible.

   a) \(2x^2 - 3x + 1\)
   
   \(2(3)^2 - 3(3) + 1\)
   
   \(2 \cdot 9 - 3(3) + 1\)
   
   \(18 - 9 + 1\)
   
   \(9 + 1\)
   
   \[10\]

   b) \(\frac{x}{3} - \frac{1}{3x}\)
   
   \(\frac{\frac{3}{3}}{3} - \frac{1}{3(3)}\)
   
   \(\frac{3}{3} - \frac{1}{3(3)}\)
   
   \(1 - \frac{1}{9}\)

   \(\\text{LCM} = 9\)

   \(\frac{9}{9} - \frac{1}{9}\)

   \(\frac{9-1}{9}\)

   \(\frac{8}{9}\)
5. Reduce the following fractions to their lowest terms.

a) \[
\frac{35x^3yz^2}{5x^2z} = \frac{7xyz}{5x^2z} = \frac{7}{5xz}
\]

b) \[
\frac{24x^2y^6z^2}{4y^2z^6} = \frac{6y^3}{z^4}
\]

6. Simplify the expressions below as much as possible.

a) \[
\left[ \left( \frac{3}{4} \right)^2 - \frac{7}{16} \right]^2 = \left[ \frac{9}{16} - \frac{7}{16} \right]^2 = \left( \frac{2}{16} \right)^2 = \left( \frac{1}{8} \right)^2 = \frac{1}{64}
\]

b) \[
\left[ \left( \frac{3}{2} \right)^3 - \frac{7}{8} \right]^2 - \frac{3}{4} = \left[ \frac{27}{8} - \frac{7}{8} \right]^2 - \frac{3}{4} = \left( \frac{20}{8} \right)^2 - \frac{3}{4} = \left( \frac{5}{2} \right)^2 - \frac{3}{4} = \frac{25}{4} - \frac{3}{4} = \frac{22}{4} = \frac{11}{2}
\]
7. (20 Points) Solve for x:

a) \[ 3x - 7 = 18 \]
\[ +7 +7 \]
\[ 3x = 25 \]
\[ \frac{3x}{3} = \frac{25}{3} \]
\[ x = \frac{25}{3} \]

b) \[ 3x - 5 = -2 \]
\[ +5 +5 \]
\[ 3x = 3 \]
\[ \frac{3x}{3} = \frac{3}{3} \]
\[ x = 1 \]

c) \[ \frac{3}{4}x - \frac{2}{3} = \frac{1}{3} + \frac{3}{2} \quad \text{LCD} = 12 \]
\[ 12\left(\frac{3}{4}\right)x - 12\left(\frac{2}{3}\right) = 12\left(\frac{1}{3}\right) + 12\left(\frac{3}{2}\right) \]
\[ 9x - 8 = 4 + 18 \]
\[ 9x - 8 = 22 \]
\[ \frac{9x}{9} = \frac{30}{9} \]
\[ x = \frac{30}{9} \]
\[ x = \frac{10}{3} \]

d) \[ \frac{3}{4}x - \frac{1}{2}x = \frac{1}{10} + \frac{1}{5} \quad \text{LCD} = 20 \]
\[ 20\left(\frac{3}{4}\right)x - 20\left(\frac{1}{2}\right)x = 20\left(\frac{1}{10}\right) + 20\left(\frac{1}{5}\right) \]
\[ 15x - 10x = 2 + 4 \]
\[ \frac{5x}{5} = \frac{6}{5} \]
\[ x = \frac{6}{5} \]
8. Write each decimal as a fraction.
   a) 0.17
      \[
      \frac{17}{100}
      \]
   b) 0.012
      \[
      \frac{12}{1000}
      \]
   c) 0.00123
      \[
      \frac{123}{100000}
      \]
   d) 0.030075
      \[
      \frac{30075}{1000000}
      \]

9. Write each word statement as a decimal number.
   a) Twenty-seven one-thousandths
      \[
      0.027
      \]
   b) Negative three and nine ten-millionths
      \[
      -3.0000009
      \]
   c) Sixty-four and twenty-three hundredths
      \[
      64.23
      \]
   d) Five thousand five and seven hundred-thousandths
      \[
      5,005.000007
      \]
10. Answer the following questions.

a) Find the **Perimeter** for the shape below.

```
3 cm
8 cm
16 cm
6 cm
8 cm
9 cm
```

\[ P = 16 + 9 + 8 + 6 + 8 + 3 \text{ cm} \]

\[ P = 50 \text{ cm} \]

b) Find the **Area** for the shape below.

\[ A = bh \]

```
6 in.
12 in.
```

\[ A = 6 \times 12 = 72 \text{ in}^2 \]

11. Find the **volume** and **surface area** of the shape below.

```
2 in.
4 in.
20 in.
```

\[ V = l \times w \times h = (20 \text{ in.})(4 \text{ in.})(2 \text{ in.}) = 160 \text{ in}^3 \]

\[ SA = 2lw + 2lh + 2wh \]

\[ SA = 2(20 \text{ in.})(4 \text{ in.}) + 2(20 \text{ in.})(2 \text{ in.}) + 2(4 \text{ in.})(2 \text{ in.}) \]

\[ SA = 160 \text{ in}^2 + 80 \text{ in}^2 + 16 \text{ in}^2 \]

\[ SA = 256 \text{ in}^2 \]