Workshop Exercises for Week 2

Attempt the following workshop exercises. These are the exercises that are used in the workshop portion of the internal lectures. No solutions are available for these exercises. Answers to selected workshop exercises are included.

1. If \( a = \frac{1}{4} \), \( b = \frac{1}{3} \), and \( c = \frac{1}{2} \), find the value of
   a) \( 24abc^3 \)
   b) \( \sqrt{\frac{2bc}{ab}} \)

2. Perform the operation and simplify:
   a) \( \frac{-9x^3}{\frac{x}{3}} \)
   b) \( \frac{x}{3} \)

3. Perform the operation and simplify:
   \( \frac{3xy^2}{9z} \)
   \( \frac{x^2y^2}{xz^4} \)

4. Simplify and express in terms of positive exponents:
   a) \( \frac{\sqrt{x}}{x^{3/2}} \)
   b) \( \frac{y^{-2}x}{z^4x^{-2}} \)

5. Simplify: \( 4x - 3y - 4(2x + 5y) \)

6. Perform the operation and simplify:
   \( \frac{4}{y-1} + \frac{3}{y} \)

7. Perform the operation and simplify:
   \( \left( \frac{4}{y-1} \right) \left( \frac{y}{2(y-1)} \right) \)
Answers

1. a) \( \frac{1}{4} \)
   
   b) 2

2. a) \(-27x^2\)
   
   b) \(-3x^2\)

3. \( \frac{z^3}{3} \)

4. a) \( \frac{1}{x} \)
   
   b) \( \frac{x^3}{y^3z^4} \)

5. \(-4x - 23y\)

6. \( \frac{7y - 3}{y^2 - y} \)

7. \( \frac{2y}{(y-1)^2} \)