

## Math 118 Exam 1 Practice Problems

Exam I will cover sections P.1 through P.7 and will be on Friday, September 16.

My office hours: Mon 9:15 - 10:45, Wed 12:15 - 1:45, Thur 12:30 - 3:00, Fri 9:15 - 10:45 in Old Main 404

Drop in tutoring: 6-8 pm on Sun, Mon, Tues, and Thur in Zurn 213

1. Simplify the following expressions completely:

(a)  $\frac{(5-3)^2 - 3[7 - (2+6)]}{(4 - \frac{1}{2}(9-3))^2}$

(b)  $(-2x^3y^{-2}z^{18})(6x^{-10}y^2z^{-5})$

(c)  $\frac{(-3a^3b^{1/2}c^{-2})^2(3ab)^{-1}}{3a^{-4}b^{5/2}c^3}$

(d)  $(8x^2 + 4x - 3) + (5x + 3) - (2x^2 + 4)$

(e)  $\frac{\frac{1}{5} - \frac{1}{x}}{5 + \frac{1}{3}}$

(f)  $\frac{2 - \frac{1}{x^2}}{\frac{1}{x^2} - 2}$

(g)  $\frac{\frac{1}{x+h} - \frac{1}{x}}{h}$

2. Expand the following products, and simplify:

(a)  $(4x + 2)(5x^3 - 2x + 6)$

(b)  $(2x + 1)^3$

3. Factor the following expressions:

(a)  $18x^3 - 6x$

(b)  $27x^2 + 9x - 6$

(c)  $x^3 + 5x^2 - 2x - 10$

(d)  $16x^2(x-1) - 40x(x-1) + 25(x-1)$

4. Multiply, divide, add, or subtract as indicated, then simplify completely:

(a)  $\frac{x^2 - 1}{3x} \cdot \frac{18x^2 - 6x}{x + 1}$

(b)  $\frac{6x + 2}{x^2 - 1} \div \frac{3x^2 + x}{x - 1}$

(c)  $\frac{1}{x + 4} + 5 \left( \frac{x}{x + 4} \right) - \frac{3}{x + 4}$

(d)  $\frac{1}{5x} - \frac{1}{5} + \frac{3}{25x^2}$

5. Solve the following equations for  $x$ :

(a)  $2(x - 4) + 3(x + 5) = 2x - 2$

(b)  $\frac{2}{x - 3} - \frac{4}{x + 3} = \frac{8}{x^2 - 9}$

(c)  $2x^2 - 11x = -5$

(d)  $2\sqrt{2x - 3} + 2x = 6$

(e)  $-3|4x - 7| + 15 = 0$

6. Simplify the following expressions:

(a)  $\sqrt{63x} - \sqrt{28x}$

(b)  $5\sqrt[3]{16} + \sqrt[3]{54}$

(c)  $\frac{\sqrt{200x^3}}{\sqrt{10x^{-1}}}$

## Math 118 Exam 1 Practice Solutions

1. (a) 7  
(b)  $-12x^{-7}z^{13}$   
(c)  $a^9b^{-5/2}c^{-7}$   
(d)  $6x^2 + 9x - 4$   
(e)  $\frac{3(x-5)}{80x}$   
(f)  $-1$   
(g)  $-\frac{1}{x(x+h)}$
  
2. (a)  $20x^4 + 10x^3 - 8x^2 + 20x + 12$   
(b)  $8x^3 + 12x^2 + 6x + 1$
  
3. (a)  $6x(3x^2 - 1)$   
(b)  $3(3x - 1)(3x + 2)$   
(c)  $(x + 5)(x^2 - 2)$   
(d)  $(x - 1)(4x - 5)^2$
  
4. (a)  $2(x - 1)(3x - 1)$   
(b)  $\frac{2}{x(x+1)}$   
(c)  $\frac{5x - 2}{x + 4}$   
(d)  $\frac{-5x^2 + 5x + 3}{25x^2}$
  
5. (a)  $x = -3$   
(b)  $x = 5$   
(c)  $x = \frac{1}{2}, 5$   
(d)  $x = 2$   
(e)  $x = \frac{1}{2}, 3$
  
6. (a)  $\sqrt{7x}$   
(b)  $13\sqrt[3]{2}$   
(c)  $2x^2\sqrt{5}$