Chapter 3 Study Guide

Key

New Content

1. Simplify expressions with positive exponents

a. $(x^3y^2)(x^5y)$

x^8y^3

b. $\frac{4x^6y^2}{16x^9y}$

$\frac{1}{4}x^{-3}y$

$= \frac{y}{4x^3}$

c. $(3x^4y^3)^2$

$9x^8y^6$

2. Simplify expressions with zero and negative exponents.

a. $(xy^{-2})^3$

$x^3y^{-6} = \frac{x^3}{y^6}$

b. $(3x^0)^{-2}$

$3^{-2} = \frac{1}{9}$

c. $\frac{(2x)^3}{4x^{-4}}$

$\frac{8x^3}{4x^{-4}} = 2x^7$

3. Use the Distributive Property to simplify expressions

a. $-2x(3x - 8)$

$-6x^2+16x$

b. $5x^2(3x + 10)$

$15x^3+50x^2$

4. Multiply binomials and polynomials

a. $(6x - 2y)(x + 8y)$

$6x^2+48xy-2xy-16y^2$

$=6x^2+46xy-16y^2$

b. $(4x + 3)(5x - 8)$

$20x^2-32x+15x-24$

$20x^2-17x-24$

c. $(2y - 3)^2$

$(2y-3)(2y-3)$

$4y^2-6y-6y+9$

$4y^2-12y+9$

5. Solve simple equations involving multiplication

a. $6(2x + 8) = 10 - 3(x + 4)$

$12x+48 = 10-3x-12$

$12x+48 = -2-3x$

$15x+48 = -2$

$15x = -50$

$x = -50/15 = -10/3$

b. $(4x - 3)(x + 2) = 4(2x - 5 + x^2)$

$4x^2+8x-3x-6 = 8x-20+4x^2$

$4x^2+5x-6 = 4x^2+8x-20$

$-6 = 3x-20$

$14 = 3x$

$14/3 = x$

6. Solve simple absolute equations

a. $|-4x+8| = 12$

$-4x+8=12$ or $-4x+8=-12$

$-4x=4$ $-4x=-20$

$x=-1$ or $x=5$

b. $|3x-7| = 15$

$3x-7=15$ or $3x-7=-15$

$3x=22$ $3x=-8$

$x=22/3$ or $x=-8/3$

c. $|-5x+4| = -10$

No Sol

Chapter 3 Study Guide

7. Rewrite multi-variable equations/formulas in terms of one of the variables

a. Solve for x: $3(4x + 9y) = 15 - 8x$

$12x + 27y = 15 - 8x$

$\frac{20x}{20} = \frac{15}{20} - \frac{27y}{20}$

$x = \frac{3}{4} - \frac{1}{10}y$

b. Solve for b_1: $A = \frac{1}{2}h(b_1 + b_2)$

$2A = h(b_1 + b_2)$

$\frac{2A}{h} = b_1 + b_2$

$\frac{2A}{h} - b_2 = b_1$

8. Operations with rational numbers

a. $-7\frac{3}{8} + 3\frac{5}{6}$

$-7\frac{9}{24} + 3\frac{20}{24}$

$-7 - \frac{9}{24} + 3 + \frac{20}{24} = -4 + \frac{11}{24}$

$= -3\frac{13}{24}$

b. $-3\frac{3}{4} + 1\frac{4}{5}$

$-\frac{15}{4} + \frac{9}{5}$

$= -\frac{15}{4} \cdot \frac{5}{9_3} = \frac{-25}{12}$

Content from previous chapters

9. Algebraically determine the equation of a line

Find the equation of the line that contains the points (4, -2) and (-5, 1)

$m = \frac{1+2}{-5-4} = \frac{3}{-9} = -\frac{1}{3}$

$y - 1 = -\frac{1}{3}(x + 5)$ — $y - 1 = -\frac{1}{3}x - \frac{5}{3}$

$y = -\frac{1}{3}x - \frac{2}{3}$

10. Simplify numeric expressions: $-5^2 - 4(2-4)^2$

$-5^2 - 4(-2)^2$

$= -25 - 4(4)$

$= -25 - 16 = -41$

11. Evaluate functions when given an equation written using function notation

a. For $f(x) = x^2 - 3x + 2$, find $f(-6)$

$f(-6) = (-6)^2 - 3(-6) + 2$

$= 36 + 18 + 2$

$f(-6) = 56$

b. For $f(x) = \sqrt[3]{4x - 8}$, find x when $f(x) = 4$.

$(4)^3 = (\sqrt{4x-8})^3$

$16 = 4x - 8$

$24 = 4x$

$6 = x$

Chapter 3 Study Guide

12. Compare functions given in different representations

Selected values of a linear function $g(x)$ are shown in the table. A portion of the graph of a quadratic function $h(x)$ is shown in the xy-plane.

$m = \frac{7-1}{-2-2} = \frac{6}{-4}$

$y = \frac{-3}{2}x + b$

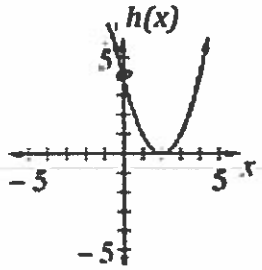
$1 = \frac{-3}{2} \cdot 2 + b$

$1 = -3 + b$

$4 = b$

x	$g(x)$
-8	16
-2	7
0	4
2	1

$y = \frac{-3}{2}x + 4$



For each statement below, use >, <, or = to compare the two quantities. Then explain how you made your decision.

First quantity	Comparison	Second Quantity
The y-coordinate of the y-intercept $g(x)$ 4	=	The y-coordinate of the y-intercept $h(x)$ 4
Explanation/Work:		
$\frac{g(2)-g(3)}{-5-3} = \frac{1-(-1/2)}{-8} = \frac{1\frac{1}{2}}{-8}$ negative	<	$\frac{h(2)-h(0)}{-5-3} = \frac{0-4}{-8} = \frac{-4}{-8} = \frac{1}{2}$ positive
Explanation/Work: $g(3) = \frac{-3}{2}(3) + 4 = -4\frac{1}{2} + 4 = -\frac{1}{2}$		

What else can you do?

1. Review the Chapter 3 homework. Any problem you missed, do again.
2. Review the Chapter 1 and Chapter 2 tests in your assessment folder.
3. Review the Chapter 3 closure problems.
4. Ask questions in class or during advisory.