

Student: James Cook
Date: 8/19/11
Time: 2:32 PM

Instructor: James Cook
Course: Math 121, section 3, Fall 2011
Book: Blitzer: College Algebra, 5e

Assignment: Assignment 0 (background concepts and Test 1)

1. Evaluate the algebraic expression for the given values of the variables.

$$x^2 - 3(x - y), \text{ for } x = 10 \text{ and } y = 1$$

$$\text{When } x = 10 \text{ and } y = 1, x^2 - 3(x - y) = \boxed{}.$$

2. Find the union of the sets.

$$\{1, 7, 8, 10\} \cup \{7, 10, 11\}$$

$$\{1, 7, 8, 10\} \cup \{7, 10, 11\} = \{\boxed{}\}$$

(Use a comma to separate answers as needed.)

3. Find the intersection of the sets.

$$\{1, 4, 5, 10\} \cap \{4, 5, 9\}$$

$$\{1, 4, 5, 10\} \cap \{4, 5, 9\} = \{\boxed{}\}$$

(Use a comma to separate answers as needed.)

4. Simplify the given algebraic expression.

$$5(3y - 3) - (5y + 7)$$

$$5(3y - 3) - (5y + 7) = \boxed{}$$

5. Simplify the algebraic expression.

$$19x^2 + 6 - [7(x^2 - 9) + 7]$$

$$19x^2 + 6 - [7(x^2 - 9) + 7] = \boxed{}$$

6. Rewrite the expression without absolute value bars.

$$|\sqrt{11} - 6|$$

$$|\sqrt{11} - 6| = \boxed{}$$

(Simplify your answer. Type an exact answer, using radicals as needed.)

7. Write the algebraic expression without parentheses.

$$-(-6x)$$

$$-(-6x) = \boxed{}$$

(Simplify your answer.)

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8. Use the zero-exponent rule to simplify the following expression.

$$(-11)^0$$

$$(-11)^0 = \square$$

9. Evaluate the given exponential expression.

$$-6^0$$

$$-6^0 = \square$$

10. Simplify the given exponential expression.

$$x^4 \cdot x^3$$

$$x^4 \cdot x^3 = \square$$

11. Simplify the expression using the power rule.

$$(x^{13})^4$$

$$(x^{13})^4 = \square \text{ (Type exponential notation with positive exponents.)}$$

12. Simplify the given exponential expression.

$$\frac{x^6}{x^{-2}}$$

$$\frac{x^6}{x^{-2}} = \square$$

13. Simplify the exponential expression.

$$\left(-\frac{3}{x}\right)^3$$

$$\left(-\frac{3}{x}\right)^3 = \square \text{ (Simplify your answer. Use positive exponents only.)}$$

14. Simplify the given exponential expression.

$$(-5x^3y^3)^2$$

$$(-5x^3y^3)^2 = \square$$

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15. Multiply using the product rule.

$$\frac{5x^5 \cdot 5x^2}{5x^5 \cdot 5x^2} = \square$$

16. Simplify the exponential expression.

$$\frac{(-3x^5y)(-8x^{11}y^{12})}{(-3x^5y)(-8x^{11}y^{12})} = \square$$

17. Simplify the expression.

$$\frac{35x^6}{7x^4}$$
$$\frac{35x^6}{7x^4} = \square$$

18. Simplify the exponential expression.

$$\frac{-6x^{14}y^6}{3x^4y^3}$$
$$\frac{-6x^{14}y^6}{3x^4y^3} = \square \text{ (Simplify your answer. Use positive exponents only.)}$$

19. Simplify the exponential expression. Assume that the variable represents a nonzero real number.

$$\frac{42z^6}{14z^9}$$
$$\frac{42z^6}{14z^9} = \square \text{ (Type exponential notation with positive exponents.)}$$

20. Simplify the exponential expression.

$$\frac{30x^4y^3}{25x^6y^{-5}}$$
$$\frac{30x^4y^3}{25x^6y^{-5}} = \square$$

(Simplify your answer. Use positive exponents only. Use integers or fractions for any numbers in the expression.)

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21. Simplify the exponential expression.

$$\left(\frac{4x^4}{y}\right)^{-3}$$

$$\left(\frac{4x^4}{y}\right)^{-3} = \square \text{ (Simplify your answer. Use positive exponents only.)}$$

22. Simplify the exponential expression.

$$\left(\frac{-16a^2b^3}{8a^8b^{-4}}\right)^3$$

$$\left(\frac{-16a^2b^3}{8a^8b^{-4}}\right)^3 = \square$$

(Simplify your answer. Type exponential notation with positive exponents.)

23. Simplify the exponential expression.

$$\left(\frac{7a^{-2}b^8}{19a^7b^{-9}}\right)^0$$

$$\left(\frac{7a^{-2}b^8}{19a^7b^{-9}}\right)^0 = \square \text{ (Simplify your answer. Use positive exponents only.)}$$

24. Simplify the exponential expression. Assume the variables represent nonzero real numbers.

$$\frac{(4^{-1}x^{-2}y^{-5})^{-5}(4x^{-5}y^2)^{-5}(16x^{-9}y^6)^0}{(4x^{-2}y^{-3})^5}$$

$$\frac{(4^{-1}x^{-2}y^{-5})^{-5}(4x^{-5}y^2)^{-5}(16x^{-9}y^6)^0}{(4x^{-2}y^{-3})^5} = \square$$

(Simplify your answer. Use positive exponents only.)

25. Multiply and simplify. Assume that all variables in a radicand represent positive real numbers and no radicands involve negative quantities raised to even powers.

$$\sqrt{4x} \cdot \sqrt{9x}$$

$$\sqrt{4x} \cdot \sqrt{9x} = \square$$

(Simplify your answer. Type an exact answer, using radicals as needed.)

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26. Simplify by factoring. Assume that all expressions under radicals represent nonnegative numbers.

$$\sqrt{x^{15}}$$

$$\sqrt{x^{15}} = \square$$

(Type an exact answer, using radicals as needed.)

27. Use the quotient rule to simplify the following expression. Assume that $x > 0$.

$$\frac{\sqrt{128x^3}}{\sqrt{2x}}$$

$$\frac{\sqrt{128x^3}}{\sqrt{2x}} = \square$$

28. Add as indicated. You will need to simplify terms before they can be combined.

$$6\sqrt{28} + \sqrt{63}$$

Select the correct choice below and fill in any answer boxes within your choice.

A. $6\sqrt{28} + \sqrt{63} = \blacksquare$

B. The terms cannot be simplified.

29. In the following problem, add or subtract terms whenever possible. Simplify the answer.

$$\sqrt{50x} - \sqrt{8x}$$

$$\sqrt{50x} - \sqrt{8x} = \square \text{ (Type an exact answer, using radicals as needed.)}$$

30. Find the indicated root, or state that the expression is not a real number.

$$\sqrt[4]{-625}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your answer.

A. $\sqrt[4]{-625} = \blacksquare$

B. The expression is not a real number.

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31. Evaluate the given expression, or indicate that the root is not a real number.

$$\sqrt[5]{-\frac{1}{243}}$$

$$\sqrt[5]{-\frac{1}{243}} = \square \text{ (Type an integer or a simplified fraction.)}$$

32. Simplify using properties of exponents.

$$(3x^{1/5})(4x^{1/2})$$

$$(3x^{1/5})(4x^{1/2}) = \square \text{ (Use fractional exponents only.)}$$

33. Simplify using properties of exponents.

$$\frac{24x^{1/5}}{6x^{1/8}}$$

$$\frac{24x^{1/5}}{6x^{1/8}} = \square \text{ (Use fractional exponents only.)}$$

34. Simplify using properties of exponents.

$$(x^{7/8})^8$$

$$(x^{7/8})^8 = \square$$

35. Use properties of rational exponents to simplify the expression. Assume that all variables represent positive numbers.

$$(32x^{15}y^{20})^{1/5}$$

$$(32x^{15}y^{20})^{1/5} = \square$$

(Use integers or fractions for any numbers in the expression. Type exponential notation with positive exponents.)

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36. Use properties of rational exponents to simplify the expression. Assume that all variables represent positive numbers.

$$\frac{(4y^{1/5})^4}{y^{3/10}}$$

$$\frac{(4y^{1/5})^4}{y^{3/10}} = \square$$

(Use integers or fractions for any numbers in the expression. Type exponential notation with positive exponents.)

37. Simplify by reducing the index of the radical.

$$\sqrt[15]{3^3}$$

$$\sqrt[15]{3^3} = \square \text{ (Type an exact answer, using radicals as needed.)}$$

38. Simplify by reducing the index of the radical.

$$\sqrt[3]{x^9}$$

$$\sqrt[3]{x^9} = \square$$

39. Simplify by reducing the index of the radical.

$$\sqrt[6]{x^{12}}$$

$$\sqrt[6]{x^{12}} = \square$$

40. Simplify by reducing the index of the radical.

$$\sqrt[25]{x^{10}y^{15}}$$

$$\sqrt[25]{x^{10}y^{15}} = \square$$

(Simplify your answer. Type an exact answer, using radicals as needed.)

41. Find the degree of the polynomial.

$$x^5 + 4x^6 + 7x + 2x^2 + 4$$

The degree is \square . (Type a whole number.)

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42. Add or subtract as indicated and find the degree of the resulting polynomial.

$$(2x^2 + 9x - 6) + (3x^2 + 3x + 10) - (5x^2 - 10)$$

$$(2x^2 + 9x - 6) + (3x^2 + 3x + 10) - (5x^2 - 10) = \square \text{ (Do not factor.)}$$

The degree of the result above is \square .

43. Find the product.

$$(5x + 3)(x^2 + 5x + 3)$$

$$(5x + 3)(x^2 + 5x + 3) = \square$$

(Simplify your answer.)

44. Find the product.

$$(x - 14)(x + 4)$$

$$(x - 14)(x + 4) = \square$$

45. Find the product.

$$(7x - 6)(4x + 5)$$

$$(7x - 6)(4x + 5) = \square$$

46. Use the FOIL method to multiply the binomials.

$$(5x^3 + 3)(x^2 - 7)$$

$$(5x^3 + 3)(x^2 - 7) = \square \text{ (Simplify your answer.)}$$

47. Multiply using the rule for the product of the sum and difference of two terms.

$$(6x + 7)(6x - 7)$$

$$(6x + 7)(6x - 7) = \square$$

48. Find the product.

$$(4x + 3)^2$$

$$(4x + 3)^2 = \square \text{ (Simplify your answer.)}$$

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49. Multiply using the rule for the square of a binomial.

$$(7x^2 - 2)^2$$

$$(7x^2 - 2)^2 = \square$$

50. Find the product.

$$(x + 3)^3$$

$$(x + 3)^3 = \square$$

(Simplify your answer.)

51. Find the product.

$$(7x + 10)^3$$

$$(7x + 10)^3 = \square$$

52. Find the product.

$$(x - 3)^3$$

$$(x - 3)^3 = \square$$

53. Use the FOIL method to multiply the binomials.

$$(x - 3y)(6x + 5y)$$

$$(x - 3y)(6x + 5y) = \square \text{ (Simplify your answer.)}$$

54. Find the product.

$$(x^4y^3 - 8)^2$$

$$(x^4y^3 - 8)^2 = \square \text{ (Simplify your answer.)}$$

55. Find the product.

$$(x - y)(x^2 - 5xy + y^2)$$

$$(x - y)(x^2 - 5xy + y^2) = \square$$

(Simplify your answer.)

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56. Perform the indicated operations.

$$(2x + 3y)^2 - (2x - 3y)^2$$

$$(2x + 3y)^2 - (2x - 3y)^2 = \square \text{ (Simplify your answer.)}$$

57. Factor the polynomial using the greatest common factor. If there is no common factor other than 1 and the polynomial cannot be factored, so state.

$$16x + 56$$

Select the correct choice below and fill in any answer boxes within your choice.

A. $16x + 56 = \square$

B. The polynomial is prime.

58. Factor out the greatest common factor in the expression.

$$7x^4 - 14x^3 + 21x^2$$

Select the correct choice below and fill in any answer boxes within your choice.

A. $7x^4 - 14x^3 + 21x^2 = \square$

B. The polynomial is prime.

59. Factor completely the given polynomial.

$$x(x + 19) - 12(x + 19)$$

Select the correct choice below and fill in any answer boxes within your choice.

A. $x(x + 19) - 12(x + 19) = \square$

B. The polynomial is prime.

60. Factor out the greatest common factor in the expression.

$$x^2(x - 8) + 16(x - 8)$$

Select the correct choice below and fill in any answer boxes within your choice.

A. $x^2(x - 8) + 16(x - 8) = \square$

B. The polynomial is prime.

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61. Factor the given polynomial.

$$x^2 + 5x + 6$$

Select the correct choice below and, if necessary, fill in the answer box within your choice.

A. $x^2 + 5x + 6 = \square$

B. The polynomial is prime.

62. Factor the trinomial, or state that the trinomial is prime.

$$x^2 - 7x - 18$$

Select the correct choice below and fill in any answer boxes within your choice.

A. $x^2 - 7x - 18 = \square$

B. The polynomial is prime.

63. Factor the given polynomial.

$$x^2 - 8x + 15$$

Select the correct choice below and, if necessary, fill in the answer box within your choice.

A. $x^2 - 8x + 15 = \square$

B. The polynomial is prime.

64. Factor the difference of two squares.

$$x^2 - 16$$

Select the correct choice below and fill in any answer boxes within your choice.

A. $x^2 - 16 = \square$

B. The polynomial is prime.

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65. Factor the difference of two squares.

$$4x^2 - 9$$

Select the correct choice below and fill in any answer boxes within your choice.

- A. $4x^2 - 9 = \blacksquare$
- B. The polynomial is prime.

66. Factor the polynomial completely.

$$x^4 - 16$$

Select the correct choice below and fill in any answer boxes within your choice.

- A. $x^4 - 16 = \blacksquare$
- B. The polynomial is prime.

67. Factor the perfect square.

$$x^2 + 8x + 16$$

Select the correct choice below and fill in any answer boxes within your choice.

- A. $x^2 + 8x + 16 = \blacksquare$
- B. The polynomial is prime.

68. Factor the expression completely or state that the polynomial is prime.

$$6x^3 - 6x$$

Select the correct choice below and fill in any answer boxes within your choice.

- A. $6x^3 - 6x = \blacksquare$
(Factor completely.)
- B. The polynomial is prime.

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69. Factor the trinomial completely.

$$3x^2 + 30x + 27$$

Select the correct choice below and fill in any answer boxes within your choice.

A. $3x^2 + 30x + 27 = \square$
(Factor completely.)

B. The polynomial is prime.

70. Factor completely, or state that the polynomial is prime.

$$2x^3 - 98x$$

Select the correct choice below and fill in any answer boxes within your choice.

A. $2x^3 - 98x = \square$

B. The polynomial is prime.

71. Factor completely, or state that the polynomial is prime.

$$x^2 + 4$$

Select the correct choice below and fill in any answer boxes within your choice.

A. $x^2 + 4 = \square$

B. The polynomial is prime.

72. Factor completely, or state that the polynomial is prime. Check the factorization using multiplication or a graphing utility.

$$y^5 - 256y$$

Select the correct choice below and fill in any answer boxes within your choice.

A. $y^5 - 256y = \square$

B. The polynomial is prime.

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73. Factor completely, or state that the polynomial is prime. Check factorization using multiplication.

$$45y^4 - 80y^2$$

Select the correct choice below and fill in any answer boxes within your choice.

A. $45y^4 - 80y^2 = \blacksquare$
(Factor completely.)

B. The polynomial is prime.

74. Factor the algebraic expression.

$$x^{6/9} - x^{1/9}$$

$$x^{6/9} - x^{1/9} = \square$$

75. Factor and simplify the algebraic expression.

$$2x^{-4/3} + 4x^{1/3}$$

$$2x^{-4/3} + 4x^{1/3} = \square$$

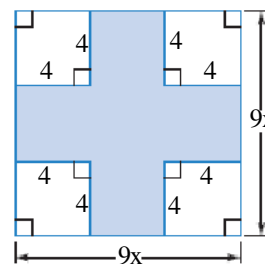
(Type the answer using positive exponents only.)

76. Factor and simplify the algebraic expression.

$$(x + 9)^{1/5} - (x + 9)^{6/5}$$

$$(x + 9)^{1/5} - (x + 9)^{6/5} = \square$$

77. Find the formula for the area of the shaded region and express it in factored form.



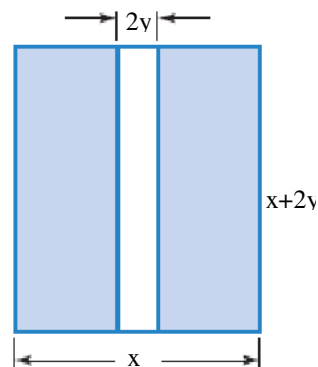
The area of the shaded region is \square .
(Factor completely.)

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78. a. Write an expression for the area of the shaded region.
b. Write the expression in factored form.



- a. The area of the shaded region is . (Do not factor.)
- b. The factored form of the expression is .

79. Find all numbers for which the rational expression is undefined. If the rational expression is defined for all real numbers, so state.

$$\frac{x}{x-2}$$

Type the values for which the rational expression is undefined. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. (Use a comma to separate answers as needed.)
- B. The rational expression is defined for all real numbers.

80. Find all numbers that must be excluded from the domain of the rational expression.

$$\frac{x-3}{x^2+6x+5}$$

The answer is .

(Use a comma to separate answers as needed.)

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81. Simplify the rational expression. Find all numbers that must be excluded from the domain of the simplified rational expression in order for it to be equivalent to the original expression.

$$\frac{x^2 + 6x + 9}{x^2 - 9}$$

Select the correct choice below and fill in any answer boxes within your choice.

A. $\frac{x^2 + 6x + 9}{x^2 - 9} = \square$, $x \neq \square$

(Use a comma to separate answers as needed.)

B. No numbers must be excluded.

82. Multiply as indicated.

$$\frac{x - 5}{x + 8} \cdot \frac{5x + 40}{7x - 35}$$

$$\frac{x - 5}{x + 8} \cdot \frac{5x + 40}{7x - 35} = \square \text{ (Simplify your answer.)}$$

83. Multiply.

$$\frac{x^2 - 16}{x^2} \cdot \frac{x^2 - 4x}{x^2 + 5x - 36}$$

Select the correct choice below and fill in any answer boxes within your choice.

A. $\frac{x^2 - 16}{x^2} \cdot \frac{x^2 - 4x}{x^2 + 5x - 36} = \square$, $x \neq \square$

(Simplify your answer. Use a comma to separate answers as needed.)

B. $\frac{x^2 - 16}{x^2} \cdot \frac{x^2 - 4x}{x^2 + 5x - 36} = \square$, no numbers must be excluded.

84. Divide as indicated.

$$\frac{x + 2}{3} \div \frac{5x + 10}{4}$$

$$\frac{x + 2}{3} \div \frac{5x + 10}{4} = \square \text{ (Simplify your answer.)}$$

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85. Divide and simplify.

$$\frac{y^2 - 25}{y} \div \frac{y + 5}{y + 8}$$

$$\frac{y^2 - 25}{y} \div \frac{y + 5}{y + 8} = \square$$

(Simplify your answer.)

86. Divide as indicated.

$$\frac{6x^2 + 10}{x - 1} \div \frac{15x^2 + 25}{x^2 - 1}$$

$$\frac{6x^2 + 10}{x - 1} \div \frac{15x^2 + 25}{x^2 - 1} = \square \text{ (Simplify your answer.)}$$

87. Add or subtract as indicated.

$$\frac{6x + 14}{3x + 5} + \frac{3x + 1}{3x + 5}$$

$$\frac{6x + 14}{3x + 5} + \frac{3x + 1}{3x + 5} = \square$$

(Simplify your answer.)

88. Subtract the fractions. Simplify if possible.

$$\frac{3x}{7x - 2} - \frac{x - 3}{7x - 2}$$

$$\frac{3x}{7x - 2} - \frac{x - 3}{7x - 2} = \square$$

89. Add and simplify your answer.

$$\frac{6}{x - 5} + \frac{5}{x + 2}$$

$$\frac{6}{x - 5} + \frac{5}{x + 2} = \square, x \neq \square$$

(Simplify your answer. Type your answer in factored form. Use a comma to separate answers as needed.)

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90. Subtract.

$$\frac{5}{x+4} - \frac{5}{x}$$

$$\frac{5}{x+4} - \frac{5}{x} = \square, x \neq \square \text{ (Simplify your answer.)}$$

91. Add.

$$\frac{x-1}{x+1} + \frac{x+1}{x-1}$$

$$\frac{x-1}{x+1} + \frac{x+1}{x-1} = \square$$

(Simplify your answer. Use positive exponents only.)

92. Add.

$$\frac{5y}{6y-12} + \frac{4y}{15y-30}$$

$$\frac{5y}{6y-12} + \frac{4y}{15y-30} = \square \text{ (Simplify your answer.)}$$

93. Add or subtract as indicated. Simplify the result, if possible.

$$\frac{8x}{x^2-16} + \frac{x}{x-4}$$

$$\frac{8x}{x^2-16} + \frac{x}{x-4} = \square$$

94. Add or subtract as indicated. Simplify the result, if possible.

$$\frac{3x+2}{x^2-1} - \frac{x+2}{x-1}$$

$$\frac{3x+2}{x^2-1} - \frac{x+2}{x-1} = \square$$

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95. Perform the indicated operations.

$$\frac{2x}{x-5} + \frac{100}{x^2-25} - \frac{2x}{x+5}$$

$$\frac{2x}{x-5} + \frac{100}{x^2-25} - \frac{2x}{x+5} = \square$$

(Simplify your answer. Type your answer in factored form.)

96. Perform the indicated operation and simplify the result. Leave your answer in factored form.

$$\frac{6 + \frac{1}{x}}{5 - \frac{1}{x}}$$

$$\frac{6 + \frac{1}{x}}{5 - \frac{1}{x}} = \square, x \neq \square$$

(Simplify your answer. Type your answer in factored form. Use a comma to separate answers as needed.)

97. Simplify the complex rational expression.

$$\frac{\frac{4}{x} + \frac{9}{y}}{9x + 4y}$$

$$\frac{\frac{4}{x} + \frac{9}{y}}{9x + 4y} = \square \text{ (Simplify your answer. Type your answer in factored form.)}$$

Find all values of x and y that must be excluded from the domain so that the equation above is true. Choose the correct answer below.

- A. $x \neq 0, y \neq 0, \text{ and } x \neq -\frac{9}{4}y$
- B. $x \neq 0, y \neq 0, \text{ and } x \neq -\frac{4}{9}y$
- C. $x \neq 0 \text{ and } y \neq 0$
- D. $x \neq 0, y \neq 0, \text{ and } x \neq \frac{9}{4}y$

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98. Simplify.

$$\frac{\frac{3p - 40}{p} + p}{p + 8}$$

What is the simplified result?

99. Simplify the complex fraction.

$$\frac{\frac{2}{x+3} - \frac{2}{x-3}}{\frac{7}{x^2-9}}$$

$$\frac{\frac{2}{x+3} - \frac{2}{x-3}}{\frac{7}{x^2-9}} = \text{} \text{ (Type a simplified rational expression.)}$$

100. Simplify the complex rational expression.

$$\frac{\frac{2}{3(x+h)^2} - \frac{2}{3x^2}}{h}$$

$$\frac{\frac{2}{3(x+h)^2} - \frac{2}{3x^2}}{h} = \text{}$$

(Simplify your answer. Use positive exponents only. Use integers or fractions for any numbers in the expression.)