

**Student:** Bobby Myers  
**Date:** 1/31/16  
**Time:** 2:47 PM

**Instructor:** Dee Wessler, Nathalie  
Dodson, Christina Horton  
**Course:** MAT1302-14A-4B16-S1  
**Book:** Bittinger: Elementary Algebra,  
Concepts and Applications, 9e

**Assignment:** Unit III Homework

1. Multiply and simplify.

$$(3a)^8 \cdot (3a)^3$$

$$(3a)^8 \cdot (3a)^3 = \square$$

(Type exponential notation with positive exponents.)

2. Simplify.

$$(ab^6)(a^5b^5)$$

$$(ab^6)(a^5b^5) = \square$$

3. Simplify. Assume that the denominator is not zero and  $0^0$  is not considered.

$$\frac{(a+b)^9}{(a+b)^9}$$

$$\frac{(a+b)^9}{(a+b)^9} = \square$$

(Simplify your answer.)

4. Divide and simplify.

$$\frac{14x^{21}y^4}{7x^4y}$$

Choose the correct answer below.

A.  $14x^{17}y^4$

B.  $2x^{17}y^3$

C.  $2x^{25}y^5$

D.  $2x^{5.3}y^4$

5. Simplify.

$$4^0 + 9^0$$

$$4^0 + 9^0 = \square$$

6. Simplify the expression.

$$(c^{25})^{10}$$

$$(c^{25})^{10} = \square$$

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7. Simplify.

$$(3x^8)^3(2x^7)$$

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$$(3x^8)^3(2x^7) = \square$$

(Simplify your answer. Use positive exponents only.)

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8. Simplify.

$$\left(\frac{4w^2x^2}{3y^2}\right)^3$$

---

$$\left(\frac{4w^2x^2}{3y^2}\right)^3 = \square$$

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

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9. Determine the coefficient and the degree of each term in the polynomial.

$$3x^2 + 7x$$

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The coefficient of the first term is  $\square$ .

The coefficient of the second term is  $\square$ .

The degree of the first term is  $\square$ .

The degree of the second term is  $\square$ .

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10. For the following polynomial  
(a) list the degree of each term  
(b) determine the leading term and the leading coefficient  
(c) determine the degree of the polynomial.

$$7a^2 - 2 + 2a^4$$

(a) The degree of the first term is .

The degree of the second term is .

The degree of the third term is .

(b) The leading term of the polynomial is .

The leading coefficient of the polynomial is .

(c) The degree of the polynomial is .

11. Combine like terms.

$$5.5b^2 - 3.5b + 7 + 5.0b - 2.4b^2 - 0.1$$

$$5.5b^2 - 3.5b + 7 + 5.0b - 2.4b^2 - 0.1 = \text{}$$

(Simplify your answer. Use integers or decimals for any numbers in the expression. Use descending order.)

12. Evaluate the polynomial for  $x = 4$  and for  $x = -4$ .

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

The value of  $3x^2 - 4x + 7$  is  when  $x$  is 4.

(Simplify your answer. Type an integer or a fraction.)

The value of  $3x^2 - 4x + 7$  is  when  $x$  is  $-4$ .

(Simplify your answer. Type an integer or a fraction.)

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13. During the first 13 sec of a jump, the number of feet that a skydiver falls in  $t$  seconds is approximated by the polynomial

$$11.12t^2.$$

In 2009, 108 U.S. skydivers fell headfirst in formation from a height of 18,000 ft. How far had they fallen 4 sec after having jumped from the plane?

The distance they had fallen 4 sec after having jumped from the plane is  ft.  
(Round to one decimal place as needed.)

14. Add.

$$(3x^6 + 8x^4 - x^3 + 6x) + (-x^6 + 3x^3 - 3x^2 + 7x^4)$$

$$(3x^6 + 8x^4 - x^3 + 6x) + (-x^6 + 3x^3 - 3x^2 + 7x^4) = \text{}$$

(Simplify your answer.)

15. Subtract the following polynomials.

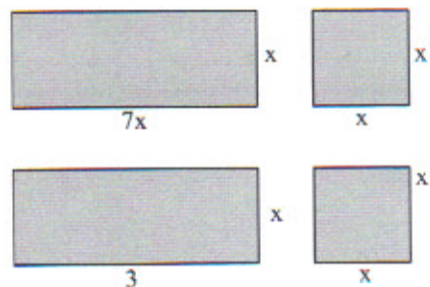
$$(3x^3 - 9x^2 + 5) - (5 - 9x^2 + 3x^3)$$

$$(3x^3 - 9x^2 + 5) - (5 - 9x^2 + 3x^3) = \text{} \text{ (Simplify your answer.)}$$

16. Solve.

(a) Find a polynomial for the sum of the areas of the rectangles shown in the figure.

(b) Find the sum of the areas when  $x = 3$  and  $x = 6$ .



(a) The polynomial for the sum of the areas is . (Simplify your answer.)

(b) When  $x = 3$ , the sum is equal to .

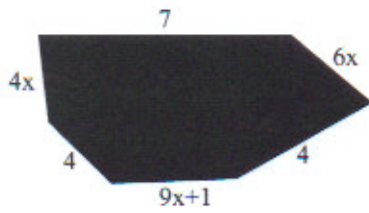
When  $x = 6$ , the sum is equal to .

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17.

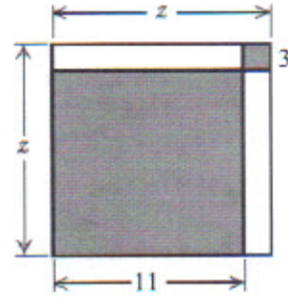


Find a polynomial for the perimeter of the figure.

The perimeter of the shaded region is .

18.

Find a polynomial for the shaded area of the given figure.



The polynomial of the shaded area is .

19.

Multiply.

$$(0.5x^9)(0.5x^4)$$

$$(0.5x^9)(0.5x^4) = \square$$

(Simplify your answer. Type coefficients as integers or decimals.)

20.

Multiply the monomial and the polynomial.

$$2x^4(5x + 4)$$

$$2x^4(5x + 4) = \square \text{ (Simplify your answer.)}$$

21.

Find the product.

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

$$(5x - 3)(x^2 - 4x + 6) = \square$$

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22. Find the product using FOIL.

$$(2a + 3)(4a + 3)$$

$$(2a + 3)(4a + 3) = \square$$

(Simplify your answer.)

23. Multiply.

$$(2y^2 - 9)(2y^2 + 9)$$

$$(2y^2 - 9)(2y^2 + 9) = \square$$

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

$$(x - 12)^2$$

$$(x - 12)^2 = \square$$

25. Multiply.

$$(-6x + 6)(x + 8)$$

The answer is  $\square$ .

(Type the terms in descending order.)

26. Multiply.

$$(y - 6)(y^2 + 6y + 36)$$

The answer is  $\square$ .

(Type the terms in descending order.)

27. A launched rocket has an altitude, in meters, given by the polynomial  $h + vt - 4.9t^2$ , where  $h$  is the height, in meters, from which the launch occurs, at velocity  $v$  in meters per second, and  $t$  is the number of seconds for which the rocket is airborne. If a rocket is launched from the top of a tower 70 meters high with an initial upward speed of 70 meters per second, what will its height be after 2 seconds?

Its height will be  $\square$  meters.

(Round to the nearest tenth.)

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28. Identify the coefficient and the degree of each term of the polynomial. Then find the degree of the polynomial.

$$x^6y - 9xy + 3x^2 - 7$$

The coefficient of  $x^6y$  is .

The degree of  $x^6y$  is .

The coefficient of  $-9xy$  is .

The degree of  $-9xy$  is .

The coefficient of  $3x^2$  is .

The degree of  $3x^2$  is .

The coefficient of  $-7$  is .

The degree of  $-7$  is .

The degree of the polynomial is .

29. Subtract the polynomials.

$$(6c^2 + 4ct - 3t^2) - (9c^2 - 2ct + 18t^2)$$

$$(6c^2 + 4ct - 3t^2) - (9c^2 - 2ct + 18t^2) = \text{}$$

30. Multiply.

$$(11a - b)(11a + b)$$

The answer is .

31. Square the binomial.

$$(9x - 6y)^2$$

The answer is .

(Simplify your answer.)

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32. Divide and check.

$$(40x^8 - 45x^4 - 25x^2) \div (-5x^2)$$

$$(40x^8 - 45x^4 - 25x^2) \div (-5x^2) = \square$$

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

33. Find the quotient.

$$\frac{30b^6f^7 - 25b^4f^5 + 15b^2f^3}{5b^2f}$$

The quotient is

$\square$ .

34. Divide.

$$(x^2 - 6x + 9) \div (x - 3)$$

$$(x^2 - 6x + 9) \div (x - 3) = \square$$

35. Divide and check.

$$(b^2 - 7b - 78) \div (b + 4)$$

$$(b^2 - 7b - 78) \div (b + 4) = \square$$

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

36. Find the quotient.

$$\frac{x^3 + 512}{x + 8}$$

$$\frac{x^3 + 512}{x + 8} = \square$$

(Simplify your answer.)

37. Divide and check.

$$(6x^4 - 4 - x - 6x^2) \div (3x^2 - 9)$$

$$(6x^4 - 4 - x - 6x^2) \div (3x^2 - 9) = \square$$

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

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38. Write an equivalent expression without negative exponents and, if possible, simplify.

$$6x^{-5}y^4$$

---

$$6x^{-5}y^4 = \square$$

39. Express using positive exponents. Then, if possible, simplify.

$$\left(\frac{x}{2}\right)^{-2}$$

---

$$\left(\frac{x}{2}\right)^{-2} = \square$$

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

40. Multiply and simplify.

$$2^{-5} \cdot 2^8$$

$$2^{-5} \cdot 2^8 = \square$$

(Type exponential notation with positive exponents.)

41. Multiply and simplify. Give answers using positive exponents.

$$(4a^{-19}b^{15}) \cdot (-9a^{-4}b^{-9})$$

$$(4a^{-19}b^{15}) \cdot (-9a^{-4}b^{-9})$$

---

$$= \square$$

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

42. Simplify. Do not use negative exponents in the answer.

$$\frac{8y^{-4}}{4y^{-11}}$$

---

$$\frac{8y^{-4}}{4y^{-11}} = \square$$

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

43. Simplify. Do not use negative exponents in the answer.

$$(4m^{-4}n^{-6})^{-3}$$

---

$$(4m^{-4}n^{-6})^{-3} = \square$$

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

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44. Simplify. Do not use negative exponents in the answer.

$$\frac{25x^{-4}y^2z^{10}}{15x^7y^{-5}z^{-4}}$$

$$\frac{25x^{-4}y^2z^{10}}{15x^7y^{-5}z^{-4}} = \square$$

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

45. Convert to decimal notation.

$$8.92 \times 10^7$$

$$8.92 \times 10^7 = \square$$

(Simplify your answer. Type an integer or a decimal.)

46. Convert to decimal notation.

$$5.642 \times 10^{-8}$$

$$5.642 \times 10^{-8} = \square$$

(Simplify your answer. Type an integer or a decimal.)

47. Convert to scientific notation.

$$21,000,000,000$$

$$21,000,000,000 = \square$$

(Use scientific notation. Use the multiplication symbol in the math palette as needed.)

48. Convert to scientific notation.

$$0.0000336$$

$$0.0000336 = \square$$

(Use scientific notation. Use the multiplication symbol in the math palette as needed.)

49. Multiply. Write the result using scientific notation.

$$(5.1 \times 10^4)(6.3 \times 10^{-2})$$

$$(5.1 \times 10^4)(6.3 \times 10^{-2})$$

$$= \square$$

(Simplify your answer. Use scientific notation. Use the multiplication symbol in the math palette as needed.)

50. Divide and write the result using scientific notation.

$$\frac{8.4 \times 10^7}{2.4 \times 10^{-7}}$$

$$\frac{8.4 \times 10^7}{2.4 \times 10^{-7}} = \square$$

(Simplify your answer. Use scientific notation. Use the multiplication symbol in the math palette as needed.)