

3.8.22 Multiplying Polynomials & Exp laws 1

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find the product.

1)  $\left(-\frac{1}{8}\right)\left(-\frac{10}{9}\right)$

A)  $\frac{5}{36}$

B)  $-\frac{89}{72}$

C)  $\frac{89}{72}$

D)  $-\frac{5}{36}$

1) \_\_\_\_\_

2)  $\left(\frac{5}{6}\right)\left(-\frac{3}{40}\right)$

A)  $-\frac{109}{120}$

B)  $\frac{109}{120}$

C)  $\frac{1}{16}$

D)  $-\frac{1}{16}$

2) \_\_\_\_\_

Evaluate.

3)  $-5x^2y$  for  $x = 4$  and  $y = 1$

A) 80

B) 20

C) -20

D) -80

3) \_\_\_\_\_

4)  $x^4y^3$  for  $x = -9$  and  $y = -1$

A) 6560

B) 6561

C) -729

D) -6561

4) \_\_\_\_\_

Find the product.

5)  $(-3)^6$

A) -729

B) -2187

C) 2187

D) 729

5) \_\_\_\_\_

6)  $(-6)^3$

A) 216

B) -36

C) 6

D) -216

6) \_\_\_\_\_

Identify the property of multiplication illustrated by the following.

7)  $\frac{1}{9} \cdot 9 = 1$

A) Inverse

B) Commutative

C) Identity

D) Associative

7) \_\_\_\_\_

8)  $5(-3 + 9) = (-3 + 9)5$

A) Associative

B) Distributive

C) Commutative

D) Inverse

8) \_\_\_\_\_

Find the product.

9)  $(-9)(-4)(-4)$

A) 144

B) 72

C) -144

D) -134

9) \_\_\_\_\_

10)  $(-3)(-3)(-3)$

A) -27

B) 27

C) -17

D) -37

10) \_\_\_\_\_

11)  $(-14)(-14)$

A) 196

B) 206

C) -196

D) -206

11) \_\_\_\_\_

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- 12)  $(-20)(-6)$  12) \_\_\_\_\_  
A) 140 B) 1200 C) 120 D) 20

Solve the problem.

- 13) After sunset in Fargo, North Dakota, the temperature fell at an average rate of  $7.5^\circ$  per hour from 5:00 PM to 7:00 PM. Using a signed number, find the change in temperature from 5:00 PM to 7:00 PM. 13) \_\_\_\_\_  
A)  $6.5^\circ$  B)  $15^\circ$  C)  $-15^\circ$  D)  $-6.5^\circ$

- 14) During one day, a certain stock dropped at an average rate of  $\frac{1}{8}$  points per hour. Using a signed number, find the change after 2 hours. 14) \_\_\_\_\_  
A)  $\frac{1}{4}$  point B) 2 points C) -2 points D)  $-\frac{1}{4}$  point

Find a numerical expression for the phrase and evaluate it.

- 15) The product of -4 and 6, added to 3 15) \_\_\_\_\_  
A) -6 B) -72 C) -21 D) 6

- 16) The product of 6 and -4, added to -7 16) \_\_\_\_\_  
A) 4 B) 34 C) 168 D) -31

Rewrite using the stated property.

- 17) Inverse property;  $5 \cdot \frac{1}{5}$  17) \_\_\_\_\_  
A) -1 B) 5 C) 1 D) 25

- 18) Commutative property;  $2 \cdot -8$  18) \_\_\_\_\_  
A)  $8 \cdot -2$  B)  $2 \cdot -8$  C)  $-2 \cdot 8$  D)  $-8 \cdot 2$

Provide an appropriate response.

- 19) True or false? The product of two negative numbers is negative. 19) \_\_\_\_\_  
A) True B) False

- 20) What is  $(-1)^n$  if n is an even whole number? 20) \_\_\_\_\_  
A) -1 B) -n C) 1 D) n

Simplify.

- 21)  $z^{2n} \cdot z^{5n}$  21) \_\_\_\_\_  
A)  $z^{10}$  B)  $z^7$  C)  $z^{7n}$  D)  $z^{10n}$

- 22)  $z^{2n-1} \cdot z^{4n+5}$  22) \_\_\_\_\_  
A)  $z^{8n+6}$  B)  $z^{8n+4}$  C)  $z^{6n+4}$  D)  $z^{6n+6}$

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Simplify using the laws of exponents.

23)  $(6^4x^3)^2(6^2x^2)^3$  23) \_\_\_\_\_  
 A)  $6^{30}x^{12}$  B)  $6^{30}x^{25}$  C)  $6^6x^{12}$  D)  $6^{14}x^{12}$

24)  $(a^5b^3c^3)^2(a^3b^3c^2)^5$  24) \_\_\_\_\_  
 A)  $a^{25} + b^{21} + c^{16}$  B)  $a^{15}b^9c^6$  C)  $a^{25}b^{21}c^{16}$  D)  $a^8b^6c^5$

Simplify.

25)  $(7z)^5(-4z) - (9z^4)(-2z^2)$  25) \_\_\_\_\_  
 A)  $-67,210z^6$  B)  $-67,246z^4$  C)  $67,210z^6$  D)  $-67,210z^5$

26)  $(-6x^4y)^2 - (5x^7y)(3xy)$  26) \_\_\_\_\_  
 A)  $21x^2y^2$  B)  $21x^8y^4$  C)  $21x^4y^2$  D)  $21x^8y^2$

Simplify using the laws of exponents.

27)  $(4^4a)^5$  27) \_\_\_\_\_  
 A)  $4^9a^5$  B)  $4^9a$  C)  $4^4a^5$  D)  $4^{20}a^5$

28)  $(-3^4)^5$  28) \_\_\_\_\_  
 A)  $-3^{20}$  B)  $3^9$  C)  $-3^9$  D)  $3^{20}$

29)  $6^9 \cdot 6^5 \cdot 6^6$  29) \_\_\_\_\_  
 A)  $216^{20}$  B)  $216^{270}$  C)  $6^{20}$  D)  $6^{270}$

30)  $(5m^4z^4)(2m^4z^2)$  30) \_\_\_\_\_  
 A)  $10mz^8$  B)  $10mz^6$  C)  $10m^8z^6$  D)  $10m^8z$

Find the product of the polynomials.

31)  $(9y - 8)(81y^2 + 72y + 64)$  31) \_\_\_\_\_  
 A)  $729y^3 + 576y^2 - 512$  B)  $729y^3 + 512$   
 C)  $729y^3 - 512$  D)  $81y^3 + 512$

32)  $(x + 3)(x^2 - x + 8)$  32) \_\_\_\_\_  
 A)  $x^3 + 2x^2 + 24$  B)  $x^3 + 2x^2 + 5x + 24$   
 C)  $x^3 + 24$  D)  $x^3 + 4x^2 + 11x + 24$

Find the product.

33)  $-3x(6x^2 + 2x + 9)$  33) \_\_\_\_\_  
 A)  $-18x^3 + 6x^2 + 27x$  B)  $-18x^3 + 2x + 9$   
 C)  $-18x^3 - 6x^2 - 27x$  D)  $-18x^3 - 6x - 27$

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- 34)  $-3(6x - 2y)$  34) \_\_\_\_\_  
 A)  $-3x + 6y$  B)  $-18x - 2y$  C)  $6x + 6y$  D)  $-18x + 6y$
- 35)  $(-4x^4y^4)(-4x^3y^2)$  35) \_\_\_\_\_  
 A)  $16x^7y^6$  B)  $16xy^7$  C)  $16x^6y^7$  D)  $16xy^6$
- 36)  $(5p^3r^2)(-4p^2q^2)(-q^4r^3)$  36) \_\_\_\_\_  
 A)  $-20p^6q^6r^6$  B)  $20p^5q^6r^7$  C)  $20p^6q^6r^6$  D)  $20p^5q^6r^5$

Find the product by using a calculator.

- 37)  $(8.26a^3b^8)(-1.79a^8b^4)$  37) \_\_\_\_\_  
 A)  $-14.7854a^{24}b^{32}$  B)  $-14.7854a^7b^{16}$   
 C)  $-14.7854a^{11}b^{12}$  D)  $14.7854a^{11}b^{12}$
- 38)  $(-7.92x^3y^9)(2.5x^5y^2)$  38) \_\_\_\_\_  
 A)  $19.8x^8y^{11}$  B)  $-19.8x^{15}y^{18}$  C)  $-19.8x^8y^{11}$  D)  $19.8x^5y^{14}$

Multiply.

- 39)  $(-3x - 12)(-5x + 1)$  39) \_\_\_\_\_  
 A)  $-8x^2 + 57x - 12$  B)  $15x^2 + 57x + 57$  C)  $-8x^2 + 57x + 57$  D)  $15x^2 + 57x - 12$
- 40)  $(5 + x)(3x + 11)$  40) \_\_\_\_\_  
 A)  $3x^2 + 25x + 55$  B)  $3x^2 + 26x + 55$  C)  $3x^2 + 55x + 26$  D)  $x^2 + 26x + 26$

Simplify.

- 41)  $2x(5x - 7) + 4(5x - 7)$  41) \_\_\_\_\_  
 A)  $10x^2 + 6x - 28$  B)  $10x^2 + 20x - 14$  C)  $10x^2 - 6x - 28$  D)  $10x^2 + 20x - 42$
- 42)  $-4x(7x - 7) - 3(4x + 3)$  42) \_\_\_\_\_  
 A)  $-28x^2 - 12x + 19$  B)  $-28x^2 - 40x - 9$   
 C)  $28x^2 - 40x - 9$  D)  $-28x^2 + 16x - 9$

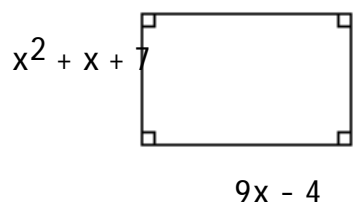
Solve the problem.

- 43) A carpenter always designs table tops where the length is 3 inches less than twice the width. If  $w$  represents the width of a table top, how would you represent the amount of oak veneer needed to cover the table top? 43) \_\_\_\_\_  
 A)  $(w^2 - 3w)$  in.<sup>2</sup> B)  $(6w - 6)$  in.<sup>2</sup> C)  $(3w - 2w^2)$  in.<sup>2</sup> D)  $(2w^2 - 3w)$  in.<sup>2</sup>

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44) Determine a polynomial that represents the area of the figure.

44) \_\_\_\_\_



A)  $9x^3 + 13x^2 + 59x - 28$

B)  $9x^3 + 5x^2 + 59x - 28$

C)  $9x^3 - 5x^2 - 59x - 28$

D)  $9x^3 - 28$

Provide an appropriate response.

45) Compute each expression and compare.

45) \_\_\_\_\_

$3^2 + 1^2; (3 + 1)^2$

A) 10; 8; sum of squares is greater than square of sum

B) 8; 8; both are equal

C) 10; 16; square of sum is greater than sum of squares

D) 8; 16; square of sum is greater than sum of squares

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

46) When is the square of a sum the sum of the squares; i.e., when is  $(A + B)^2$  equal to  $A^2 + B^2$ ? 46) \_\_\_\_\_

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find the product.

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

47) \_\_\_\_\_

A)  $x^3 - y^3$

B)  $x^3 + xy + y^3$

C)  $x^3 + y^3$

D)  $x^3 - 2x^2y + 2xy^2 + y^3$

48)  $(5a - 4b)(25a^2 + 20ab + 16b^2)$

48) \_\_\_\_\_

A)  $125a^3 - 20ab - 64b^3$

B)  $125a^3 + 201b^3$

C)  $125a^3 - 20ab + 201b^3$

D)  $125a^3 - 64b^3$

49)  $(x + 1)(x - 1)$

49) \_\_\_\_\_

A)  $x^2 + 2x - 1$

B)  $x^2 - 2x - 1$

C)  $x^2 - 1$

D)  $x^2 - 2$

50)  $(4a + 5c)(4a - 5c)$

50) \_\_\_\_\_

A)  $16a^2 + 40ac - 25c^2$

B)  $4a^2 - 5c^2$

C)  $16a^2 - 40ac - 25c^2$

D)  $16a^2 - 25c^2$

Find the product using FOIL.

51)  $(2x - 3)(2x + 3)$

51) \_\_\_\_\_

A)  $4x^2 - 9$

B)  $4x^2 + 12x - 9$

C)  $2x^2 + 12x - 9$

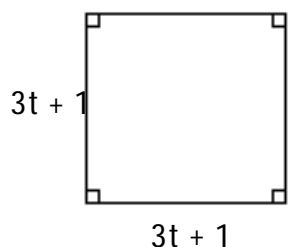
D)  $4x^2 - 12x - 9$

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- 52)  $(x - 3y)(2x + 2y)$  52) \_\_\_\_\_  
 A)  $2x^2 - 4xy - 6y^2$       B)  $2x^2 - 4xy - 4y^2$       C)  $x^2 - 4xy - 4y^2$       D)  $x^2 - 4xy - 6y^2$

Solve the problem.

- 53) Determine a polynomial that represents the area of the figure. 53) \_\_\_\_\_



- A)  $6t^2 + 6t + 2$       B)  $9t^2 + 6t + 1$       C)  $9t^2 + 1$       D)  $9t^2 + 3t + 1$

- 54) Determine a polynomial that represents the area of a square having sides of length  $s = x + 7$ . 54) \_\_\_\_\_  
 A)  $x^2 + 49$       B)  $4x + 28$       C)  $x^2 + 14x + 49$       D)  $x^2 + 14x - 49$

Find the square.

- 55)  $(5x + 11y)^2$  55) \_\_\_\_\_  
 A)  $5x^2 + 110xy + 121y^2$       B)  $5x^2 + 121y^2$   
 C)  $25x^2 + 121y^2$       D)  $25x^2 + 110xy + 121y^2$

- 56)  $(2a - 11)^2$  56) \_\_\_\_\_  
 A)  $4a^2 + 121$       B)  $2a^2 - 44a + 121$   
 C)  $4a^2 - 44a + 121$       D)  $2a^2 + 121$

Write an expression or equation representing the following and simplify if possible.

- 57) The square of the difference of 4 and z. 57) \_\_\_\_\_  
 A)  $4 - z^2$       B)  $(4 - z)^2 = z^2 - 8z + 16$   
 C)  $(4 - z)(4 + z) = -z^2 + 16$       D)  $(z - 4)^2 = z^2 + 8z + 16$

- 58) 5 more than the square of y. 58) \_\_\_\_\_  
 A)  $y + 5$       B)  $y^2 + 5$   
 C)  $y + 25$       D)  $(y + 5)^2 = y^2 + 10y + 25$

Evaluate the expression.

- 59)  $2x^2yz$  for  $x = -2$ ,  $y = -2$ , and  $z = 3$  59) \_\_\_\_\_  
 A) -48      B) 24      C) -24      D) 48

- 60)  $-5v^2t$  for  $v = 1$  and  $t = 2$  60) \_\_\_\_\_  
 A) 10      B) -10      C) -20      D) 20

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Evaluate the expression, given  $x = -2$ ,  $y = 3$ , and  $a = -4$ .

61)  $\frac{4x^3 - 7y}{7x^3 - 4y}$

61) \_\_\_\_\_

A)  $\frac{53}{68}$

B)  $\frac{1}{4}$

C)  $\frac{53}{44}$

D) - 1

62)  $(-2x^2 + 8y^2)(-6a)$

62) \_\_\_\_\_

A) -672

B) -528

C) 1536

D) 288

Answer Key

Testname: 3.8.22 MULTI POLY EXPONENT RULES 1

- 1) A
- 2) D
- 3) D
- 4) D
- 5) D
- 6) D
- 7) A
- 8) C
- 9) C
- 10) A
- 11) A
- 12) C
- 13) C
- 14) D
- 15) C
- 16) D
- 17) C
- 18) D
- 19) B
- 20) C
- 21) C
- 22) C
- 23) D
- 24) C
- 25) A
- 26) D
- 27) D
- 28) A
- 29) C
- 30) C
- 31) C
- 32) B
- 33) C
- 34) D
- 35) A
- 36) D
- 37) C
- 38) C
- 39) D
- 40) B
- 41) A
- 42) D
- 43) D
- 44) B
- 45) C
- 46)  $(A + B)^2$  is  $A^2 + 2AB + B^2$ , so  $(A + B)^2$  equals  $A^2 + B^2$  when  $2AB = 0$ , that is  $A = 0$  or  $B = 0$ . The square of a sum is the sum of the squares when at least one of the numbers is 0.
- 47) C



Answer Key

Testname: 3.8.22 MULTI POLY EXPONENT RULES 1

- 48) D
- 49) C
- 50) D
- 51) A
- 52) A
- 53) B
- 54) C
- 55) D
- 56) C
- 57) B
- 58) B
- 59) A
- 60) B
- 61) A
- 62) C