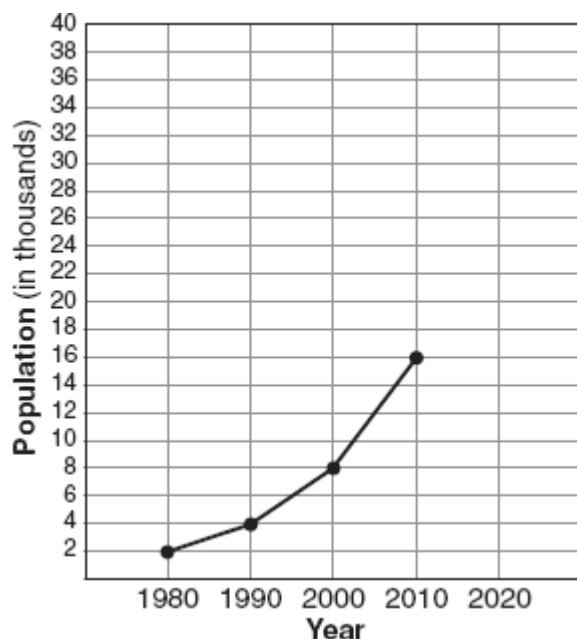


CHAPTER 8-2

REGRESSION

1. 080705a, P.I. A2.S.7

The population growth of Boomtown is shown in the accompanying graph.



If the same pattern of population growth continues, what will the population of Boomtown be in the year 2020?

- [A] 20,000 [B] 40,000
[C] 64,000 [D] 32,000

CHAPTER 8-4

ZERO AND NEGATIVE POWERS

2. 060020a, P.I. A2.A.8

What is the value of 3^{-2} ?

- [A] $-\frac{1}{9}$ [B] 9 [C] $\frac{1}{9}$ [D] -9

3. 080522a, P.I. A2.A.8

What is the value of 2^{-3} ?

- [A] $\frac{1}{6}$ [B] -6 [C] $\frac{1}{8}$ [D] -8

4. 010723a, P.I. A2.A.8

What is the value of $3^0 + 3^{-2}$?

- [A] 0 [B] $1\frac{1}{9}$ [C] $\frac{1}{9}$ [D] 6

5. 080730a, P.I. A2.A.8

The expression $(\frac{3}{4})^2 \cdot (\frac{1}{4})^{-2}$ is equivalent to

- [A] 9 [B] $\frac{9}{16}$ [C] $\frac{9}{256}$ [D] 3

6. 080119a, P.I. A2.A.9

Which expression is equivalent to $x^{-1} \cdot y^2$?

- [A] xy^2 [B] $\frac{y^2}{x}$ [C] $\frac{x}{y^2}$ [D] xy^{-2}

7. 010511a, P.I. A2.A.9

Which expression is equivalent to x^{-4} ?

- [A] $\frac{1}{x^4}$ [B] x^4 [C] $-4x$ [D] 0

8. 010824b, P.I. A.A.12

Simplify the expression $(m^6)^{-\frac{2}{3}}$ and write your answer using a positive exponent.

9. 080423b

Solve for x : $x^{-3} = \frac{27}{64}$

CHAPTER 8-5

SCIENTIFIC NOTATION

10. 080004a, P.I. 7.N.6
Expressed in decimal notation, 4.726×10^{-3} is
[A] 0.004726 [B] 4,726
[C] 0.04726 [D] 472.6
11. 060301a, P.I. 7.N.6
The number 8.375×10^{-3} is equivalent to
[A] 0.08375 [B] 8,375
[C] 0.008375 [D] 0.0008375
12. 080424a, P.I. 7.N.6
The number 156×10^{-2} is equivalent to
[A] 156 [B] 0.0156
[C] 0.00156 [D] 0.156
13. 080511a, P.I. 7.N.5
The expression 0.62×10^3 is equivalent to
[A] 62,000 [B] 0.062
[C] 6.2×10^4 [D] 6.2×10^2
14. 089904a, P.I. 7.N.7
Which expression is equivalent to 6.02×10^{23} ?
[A] 602×10^{21} [B] 0.602×10^{21}
[C] 60.2×10^{21} [D] 6020×10^{21}
15. 080210a, P.I. 7.N.5
If 0.0347 is written by a scientist in the form 3.47×10^n , the value of n is
[A] -3 [B] 3 [C] -2 [D] 2
16. 060720a, P.I. 7.N.5
According to the 2000 census, the population of New York State was approximately 18,900,000. How is this number expressed in scientific notation?
[A] 18.9×10^6 [B] 189×10^7
[C] 1890×10^4 [D] 189×10^5
17. 010111a, P.I. 7.N.5
The distance from Earth to the Sun is approximately 93 million miles. A scientist would write that number as
[A] 93×10^7 [B] 93×10^{10}
[C] 9.3×10^6 [D] 9.3×10^7
18. 080715a, P.I. 7.N.5
The video of the movie *Star Wars* earned \$193,500,000 in rental fees during its first year. Expressed in scientific notation, the number of dollars earned is
[A] 1935×10^6 [B] 1935×10^8
[C] 1.935×10^6 [D] 1.935×10^8
19. 080607a, P.I. 7.N.5
A micron is a unit used to measure specimens viewed with a microscope. One micron is equivalent to 0.00003937 inch. How is this number expressed in scientific notation?
[A] 3.937×10^{-5} [B] 3.937×10^5
[C] 3937×10^{-8} [D] 3937×10^8
20. 010206a, P.I. 7.N.5
The approximate number of seconds in a year is 32,000,000. When this number is written in scientific notation, the numerical value of the exponent is
[A] 8 [B] 7 [C] -7 [D] 6

21. 060504a, P.I. 7.N.5
The mass of an orchid seed is approximately 0.0000035 gram. Written in scientific notation, that mass is equivalent to 3.5×10^n . What is the value of n ?

[A] -7 [B] -6 [C] -5 [D] -8

22. 010609a, P.I. 7.N.5
The size of a certain type of molecule is 0.00009078 inch. If this number is expressed as 9.078×10^n , what is the value of n ?

[A] 8 [B] 5 [C] -5 [D] -8

23. 060628a
What is the sum of 6×10^3 and 3×10^2 ?

[A] 6.3×10^3 [B] 18×10^5
[C] 9×10^5 [D] 9×10^6

24. 060207a, P.I. A.N.4
If 3.85×10^6 is divided by 385×10^4 , the result is

[A] 0.01 [B] 1
[C] 3.85×10^{10} [D] 3.85×10^4

25. 010319a, P.I. A.N.4
What is the value of $\frac{6.3 \times 10^8}{3 \times 10^4}$ in scientific notation?

[A] 2.1×10^2 [B] 2.1×10^4
[C] 2.1×10^{-2} [D] 2.1×10^{-4}

26. fall0725ia, P.I. A.N.4
What is the quotient of 8.05×10^6 and 3.5×10^2 ?

[A] 2.3×10^{12} [B] 2.3×10^4
[C] 2.3×10^3 [D] 2.3×10^8

27. 010018a, P.I. A.N.4
If the number of molecules in 1 mole of a substance is 6.02×10^{23} , then the number of molecules in 100 moles is

[A] 6.02×10^{22} [B] 6.02×10^{25}
[C] 6.02×10^{21} [D] 6.02×10^{24}

28. 060429a, P.I. A.N.4
If the mass of a proton is 1.67×10^{-24} gram, what is the mass of 1,000 protons?

[A] 1.67×10^{-23} [B] 1.67×10^{-22}
[C] 1.67×10^{-21} [D] 1.67×10^{-27}

CHAPTER 8-6

OPERATIONS WITH POWERS

29. 010413a, P.I. A.A.12
The expression $8^{-4} \cdot 8^6$ is equivalent to

[A] 8^{-24} [B] 8^{-2} [C] 8^{10} [D] 8^2

30. 060312a, P.I. A.A.12
The expression $3^2 \cdot 3^3 \cdot 3^4$ is equivalent to

[A] 3^9 [B] 27^9 [C] 3^{24} [D] 27^{24}

31. 069911a, P.I. A.A.12
The expression $2^3 \cdot 4^2$ is equivalent to

[A] 8^6 [B] 2^{12} [C] 2^7 [D] 8^5

32. 010008a, P.I. A.A.12
The expression $(x^2z^3)(xy^2z)$ is equivalent to

[A] $x^3y^2z^4$ [B] $x^4y^2z^5$
[C] $x^3y^3z^4$ [D] $x^2y^2z^3$

33. 080001a, P.I. A.A.12
The product of $2x^3$ and $6x^5$ is

[A] $10x^{15}$ [B] $10x^8$
[C] $12x^{15}$ [D] $12x^8$

34. 010205a, P.I. A.A.12
The product of $3x^2y$ and $-4xy^3$ is
[A] $-12x^3y^4$ [B] $12x^3y^4$
[C] $-12x^2y^3$ [D] $12x^2y^3$
35. 010306a, P.I. A.A.12
The product of $3x^5$ and $2x^4$ is
[A] $6x^{20}$ [B] $5x^{20}$ [C] $5x^9$ [D] $6x^9$
36. 089906a, P.I. A.A.12
The product of $4x^2y$ and $2xy^3$ is
[A] $8x^2y^3$ [B] $8x^3y^4$
[C] $8x^3y^3$ [D] $8x^2y^4$
37. 080605a, P.I. A.A.12
What is the product of $10x^4y^2$ and $3xy^3$?
[A] $30x^5y^6$ [B] $30x^5y^5$
[C] $30x^4y^5$ [D] $30x^4y^6$
38. 060604a, P.I. A.A.12
What is the product of $\frac{1}{3}x^2y$ and $\frac{1}{6}xy^3$?
[A] $\frac{1}{9}x^3y^4$ [B] $\frac{1}{18}x^2y^3$
[C] $\frac{1}{2}x^2y^3$ [D] $\frac{1}{18}x^3y^4$

CHAPTER 8-7

39. 010728a, P.I. A.A.12
The expression $(6x^3y^6)^2$ is equivalent to
[A] $12x^6y^{12}$ [B] $36x^5y^8$
[C] $6x^6y^{12}$ [D] $36x^6y^{12}$

40. 010529a, P.I. A.A.12
Expressed in its simplest form,
 $(3x^3)(2y)^2(4x^4)$ is equivalent to
[A] $48x^7y^2$ [B] $24x^7y^2$
[C] $48x^{12}y^2$ [D] $24x^{12}y^2$
41. 010506a, P.I. A.A.12
The product of $(5ab)$ and $(-2a^2b)^3$ is
[A] $-40a^7b^4$ [B] $-40a^6b^4$
[C] $-30a^7b^4$ [D] $-30a^6b^4$

CHAPTER 8-8

42. 080405a, P.I. A.A.12
When $-9x^5$ is divided by $-3x^3$, $x \neq 0$, the quotient is
[A] $3x^2$ [B] $-3x^2$
[C] $27x^8$ [D] $-27x^{15}$
43. 060005a, P.I. A.A.12
The quotient of $-\frac{15x^8}{5x^2}$, $x \neq 0$, is
[A] $-10x^6$ [B] $-3x^6$
[C] $-10x^4$ [D] $-3x^4$
44. 060707a, P.I. A.A.12
The expression $\frac{-32x^8}{4x^2}$, $x \neq 0$, is equivalent to
[A] $-8x^4$ [B] $8x^4$
[C] $8x^6$ [D] $-8x^6$
45. 060518a, P.I. A.A.12
If $x \neq 0$, then $\frac{(x^2)^3}{x^5} \cdot 1000$ is equivalent to
[A] $1000x$ [B] $1000 + x$
[C] 1000 [D] 0

46. 080526a, P.I. A.A.12

The expression $\frac{5x^6y^2}{x^8y}$ is equivalent to

[A] $\frac{5y^3}{x^{14}}$

[B] $5x^{14}y^3$

[C] $\frac{5y}{x^2}$

[D] $5x^2y$

47. 010817a, P.I. A.A.12

The expression $\frac{4x^2y^3}{2xy^4}$ is equivalent to

[A] $\frac{2y}{x}$

[B] $-2xy$

[C] $2xy$

[D] $\frac{2x}{y}$

48. fall0703ia, P.I. A.A.12

Which expression represents $\frac{(2x^3)(8x^5)}{4x^6}$ in simplest form?

[A] x^2

[B] x^9

[C] $4x^2$

[D] $4x^9$

49. 080415b, P.I. A.A.12

The expression $\frac{(b^{2n+1})^3}{b^n \cdot b^{4n+3}}$ is equivalent to

[A] b^{-3n}

[B] b^n

[C] $\frac{b^n}{2}$

[D] b^{-3n+1}

[1] D

[2] C

[3] C

[4] B

[5] A

[6] B

[7] A

[2] $\frac{1}{m^4}$ or $(\frac{1}{m})^4$, and appropriate work is shown.

[1] Appropriate work is shown, but one computational error is made,

or [1] Appropriate work is shown, but one conceptual error is made.

or [1] Appropriate work is shown, but the answer is expressed with a negative exponent, such as m^{-4} .

[1] $\frac{1}{m^4}$ or $(\frac{1}{m})^4$, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[8] incorrect procedure.

[2] $\frac{4}{3}$ or $1\frac{1}{3}$ or $1.\bar{3}$, and appropriate work is shown.

[1] Appropriate work is shown, but one computational error is made.

or [1] Appropriate work is shown, but one conceptual error is made.

or [1] $\frac{4}{3}$ or $1\frac{1}{3}$ or $1.\bar{3}$, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[9] incorrect procedure.

[10] A

[11] C

[12] B

[13] D

[14] A

[15] C

[16] B

[17] D

[18] D

[19] A

[20] B

[21] B

[22] C

[23] A

[24] B

[25] B

[26] B

[27] B

[28] C

[29] D

[30] A

[31] C

[32] A

[33] D

[34] A

[35] D

[36] B

[37] B

[38] D

[39] D

[40] A

[41] A

[42] A

[43] B

[44] D

[45] A

[46] C

[47] D

[48] C

[49] B