

Algebra 1 MP4 Study Guide

Multiple Choice

Identify the letter of the choice that best completes the statement or answers the question.

Graph each system. Tell whether the system has *no solution*, *one solution*, or *infinitely many solutions*.

- _____ 1. $y = 5x - 4$
 $y = 5x - 5$
a. no solutions
b. one solution
c. infinitely many solutions
- _____ 2. $y = 2x - 3$
 $y = -x + 3$
a. one solution
b. no solutions
c. infinitely many solutions

Solve the system of equations using substitution.

- _____ 3. $3x + 2y = 7$
 $y = -3x + 11$
a. $(6, -3)$ b. $(6, -7)$ c. $\left(-4, \frac{19}{2}\right)$ d. $(5, -4)$

Solve the system using elimination.

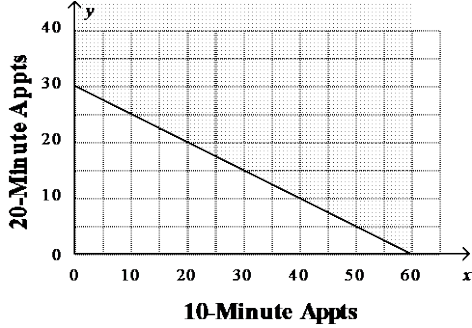
- _____ 4. $3x + y = 11$
 $4x - y = 17$
a. $(-1, 4)$ b. $(4, -1)$ c. $(5, -4)$ d. $(1, 4)$
- _____ 5. A jar containing only nickels and dimes contains a total of 60 coins. The value of all the coins in the jar is \$4.45. Solve by elimination to find the amount of nickels and dimes that are in the jar.
a. 30 nickels and 28 dimes c. 29 nickels and 31 dimes
b. 31 nickels and 29 dimes d. 30 nickels and 32 dimes
- _____ 6. An ice skating arena charges an admission fee for each child plus a rental fee for each pair of ice skates. John paid the admission fees for his six nephews and rented five pairs of ice skates. He was charged \$32.00. Juanita paid the admission fees for her seven grandchildren and rented five pairs of ice skates. She was charged \$35.25. What is the admission fee? What is the rental fee for a pair of skates?
a. admission fee: \$3.25 c. admission fee: \$3.00
skate rental fee: \$2.50 skate rental fee: \$2.00
b. admission fee: \$3.50 d. admission fee: \$4.00
skate rental fee: \$3.00 skate rental fee: \$3.50
- _____ 7. You decide to market your own custom computer software. You must invest \$3,255 for computer hardware, and spend \$2.90 to buy and package each disk. If each program sells for \$13.75, how many copies must you sell to break even?
a. 196 copies b. 301 copies c. 300 copies d. 195 copies
- _____ 8. Mike and Kim invest \$14,000 in equipment to print yearbooks for schools. Each yearbook costs \$7 to print and sells for \$35. How many yearbooks must they sell before their business breaks even?

- a. 650 b. 2,000 c. 500 d. 400

9. A doctor's office schedules 10-minute and 20-minute appointments. The doctor also makes hospital rounds for four hours each weekday.

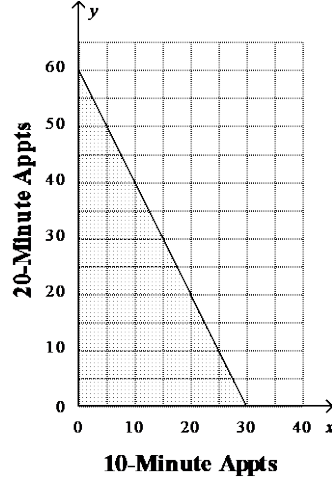
- a. Suppose the doctor limits these activities to, at most, 30 hours per week. Write an inequality to represent the number of each type of office visit she may have in a week. Let x represent the number of 10-minute appointments and y the number of 20-minute appointments.
 b. Graph the inequality.
 c. Is $(63, 30)$ a solution of the inequality?

a. $10x + 20y \geq 600$



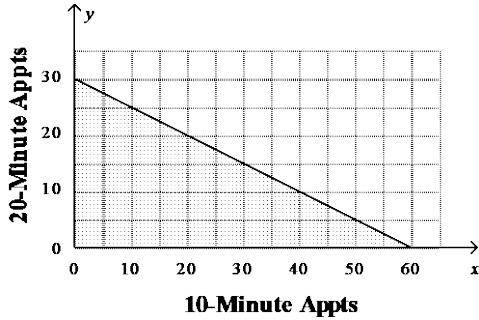
yes

c. $20x + 10y \leq 600$



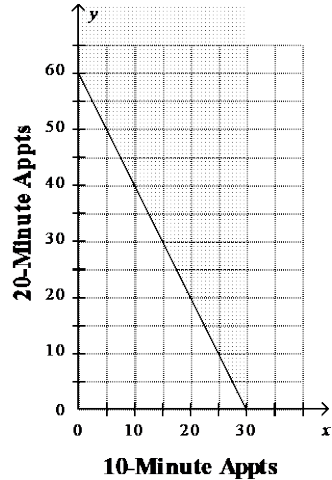
no

b. $10x + 20y \leq 600$



no

d. $20x + 10y \geq 600$



yes

Simplify the expression.

10. $25 \cdot 5^{-4}$

- a. $\frac{1}{25}$ b. $-15,625$ c. $\frac{25}{625}$ d. -500

11. $-4x^3 \cdot 2y^{-2} \cdot 5y^5 \cdot x^{-8}$

- a. $\frac{x^2}{40y^3}$ b. $\frac{40y^3}{x^5}$ c. $\frac{2x^5}{5y^3}$ d. $\frac{5y^3}{2x}$
- ___ 12. $(k^2)^4$
 a. k^6 b. $2k^8$ c. k^{16} d. k^8
- ___ 13. $(5k^2)^3$
 a. $125k^6$ b. $125k^5$ c. $5k^6$ d. $5k^8$
- ___ 14. $\frac{x^{14}}{x^7}$
 a. x^7 b. x^{98} c. $\frac{1}{x^7}$ d. x^{21}
- ___ 15. $\frac{9^7}{9^9}$
 a. $\frac{1}{81}$ b. 9^{16} c. $\frac{1}{9^{16}}$ d. 81
- ___ 16. $\frac{m^{-5}n^{-3}}{m^{-13}n^{-1}}$
 a. $\frac{n^{-9}}{n^{-14}}$ b. m^3n^{12} c. $\frac{m^7}{n^2}$ d. m^7n^2
- ___ 17. $\left(\frac{(-1)^5}{(-2)^{-3}}\right)^2$
 a. $\frac{1}{64}$ b. 64 c. 2^{30} d. 2^{-30}

Simplify the expression. Write the answer using scientific notation.

- ___ 18. Astronomers measure large distances in light-years. One light-year is the distance that light can travel in one year, or approximately 5,880,000,000,000 miles. Suppose a star is 13.6 light-years from Earth. In scientific notation, how many miles away is it?
 a. 1.36×10^{12} miles c. 7.9968×10^{13} miles
 b. 5.88×10^{12} miles d. 5.88×10^{13} miles
- ___ 19. $(9 \times 10^7)(7 \times 10^9)$
 a. 6.3×10^{64} b. 6.3×10^{17} c. 1.6×10^{64} d. 1.6×10^{17}

Complete the equation, by supplying the missing exponent.

- ___ 20. $m^{\blacksquare} \cdot n^2 \cdot m^3 = m^{11}n^2$
 a. 4 b. -3 c. -8 d. 8
- ___ 21. Determine whether $(n^a)^b = n^{a^b}$ is *always*, *sometimes*, or *never* true.
 a. always b. sometimes c. never

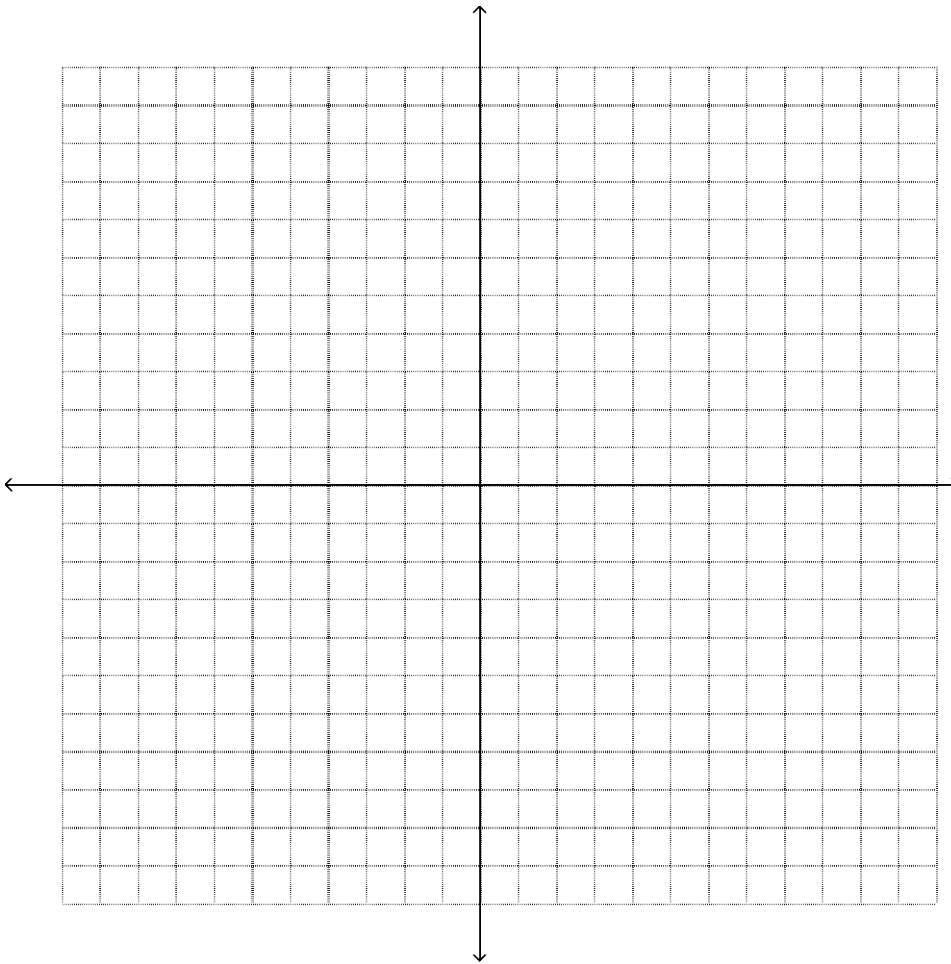
Find the common ratio of the sequence.

- _____ 22. $-164, -82, -41, -20.5, \dots$
a. -82 b. 2 c. $\frac{1}{2}$ d. 82
- _____ 23. Suppose a laboratory has a 26 g sample of polonium-210. The half-life of polonium-210 is about 138 days.
a. How many half-lives of polonium-210 occur in 276 days?
b. How much polonium is in the sample 276 days later?
a. $2; 6.5$ g c. $2; 13$ g
b. $3; 3.25$ g d. $2; 1,794$ g

Short Answer

24. Graph the following linear inequalities on the same coordinate plane. What figure does the solution to all three inequalities make?

$$y \geq -5$$
$$y \leq 2x + 5$$
$$y \leq -2x + 5$$



25. A scientist counts 35 bacteria present in a culture and finds that the number of bacteria triples each hour. The function $y = 35 \cdot 3^x$ models the number of bacteria after x hours.
- Graph the function.
 - Use the graph to estimate when there will be about 550 bacteria in the culture.

