Beginning Algebra Self-assessment

You should be able to find the correct solution to each problem without working backwards from the given solutions and without using a calculator.

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

Solve.

1) The code to unlock a safety deposit box is three consecutive odd integers whose sum is 81. Find the integers. 1) _____

A) 25, 27, 29 B) 27, 29, 31 C) 27, 28, 29 D) 26, 28, 30

2) Melissa invested a sum of money at 3% annual simple interest. She invested three times that sum at 5% annual simple interest. If her total yearly interest from both investments was $3600, how much was invested at 3%? 2) _____

A) $45,000 B) $20,000 C) $135,000 D) $15,000

3) If two planes leave an airport at the same time with one flying west at 560 miles per hour and the other flying east at 410 miles per hour, how long will it take them to be 3880 miles apart? 3) _____

A) 5 hr B) 3.5 hr C) 3 hr D) 4 hr

4) A boat moves 8 kilometers upstream in the same amount of time it moves 19 kilometers downstream. If the rate of the current is 5 kilometers per hour, find the rate of the boat in still water. 4) _____

A) $3\frac{7}{11}$ km/hr B) $13\frac{9}{11}$ km/hr C) 5 km/hr D) $12\frac{3}{11}$ km/hr

5) A window washer accidentally drops a bucket from the top of a 144-foot building. The height h of the bucket after t seconds is given by $h = -16t^2 + 144$. When will the bucket hit the ground? 5) _____

A) 48 sec B) -3 sec C) 3 sec D) 9 sec

Provide an appropriate response.

6) Determine whether the graphs of $7x - y = -10$ and $y = \frac{1}{7}x + 15$ are parallel lines, perpendicular lines, or neither. 6) _____

A) parallel B) perpendicular C) neither

7) Find any real numbers for which the following expression is undefined. 7) _____

$$\frac{x + 9}{x^2 + 13x - 68}$$

A) $x = -9$ B) $x = -17, x = 4$

C) $x = -9, x = -17, x = 4$ D) $x = -4, x = 17$

Solve the problem by writing and using a system of linear equations.

8) Find the amount of a 10% saline solution a lab assistant should add to 60 cc (cubic centimeters) of a 20% saline solution in order to have a 13% solution. 8) _____

A) 190 cc B) 40 cc C) 140 cc D) 10 cc

Solve the equation for the indicated variable.

9) $I = Prt$ for r 9) _____

A) $r = P - It$ B) $r = \frac{I}{Pt}$ C) $r = \frac{P - 1}{It}$ D) $r = \frac{P - I}{1 + t}$

Solve the system by the substitution method or the addition method.

10) $\begin{cases} \frac{x - 2}{2} = \frac{1 - y}{4} \\ \frac{5 - 2x}{3} = \frac{y}{3} \end{cases}$ 10) _____

A) $(2, -4)$ B) $(2, 3)$ C) $(4, -3)$ D) $(-6, 9)$

11) $\begin{cases} 0.02x - 0.06y = -0.28 \\ 0.2x + 0.6y = 0.8 \end{cases}$ 11) _____

A) $(0.06, -0.02)$ B) $(10, -1.28)$

C) infinite number of solutions D) $(-5, 3)$

Solve the equation.

12) $\frac{6}{x^2 - 9} = \frac{1}{x + 3} - \frac{3}{x - 3}$ 12) _____

A) 18 B) no solution C) 9 D) -9

13) $-0.3(x - 8) + x = 0.5(6 - x)$ 13) _____

A) 0.5 B) 0.33 C) 3 D) 4.5

14) $\frac{8}{a - 8} = \frac{a}{a - 8} + 3$ 14) _____

A) no solution B) -8 C) 8 D) 8, -8

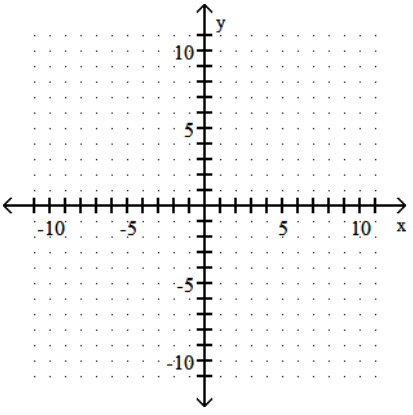
Solve the system of equations by the substitution method.

15) $\begin{cases} 4x - 3y = -11 \\ y = x + 3 \end{cases}$ 15) _____

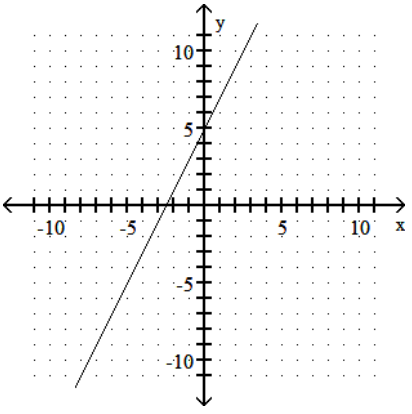
A) $(0, 3)$ B) $(1, 2)$ C) $(-2, 1)$ D) $(-4, -3)$

Graph.

16) $4x + 2y = -10$ 16) _____



A)



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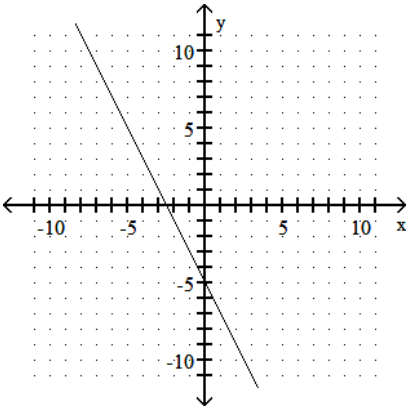

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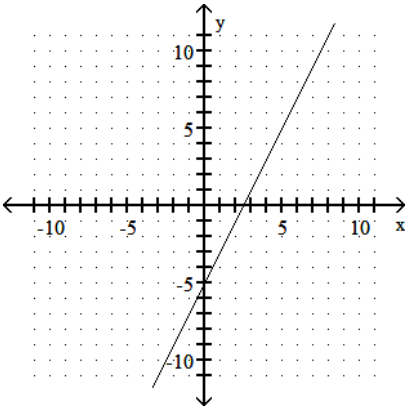
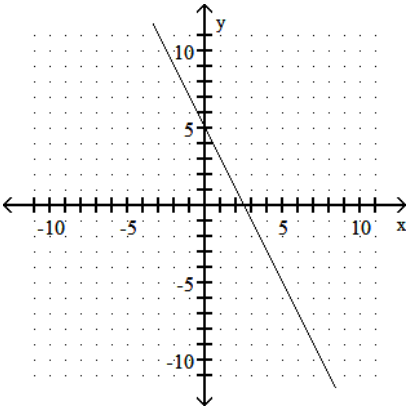


D)



Simplify the exponential expression. Write the result using only positive exponents.

17) $\frac{r^{-8}}{r^{-2}}$ 17) _____

A) r^6 B) $\frac{1}{r^6}$ C) $\frac{1}{r^{10}}$ D) r^{10}

Solve using the square root property.

18) $3k^2 = 147$ 18) _____

A) ± 7 B) 2401 C) $\pm \frac{7\sqrt{3}}{3}$ D) $\pm \frac{49}{2}$

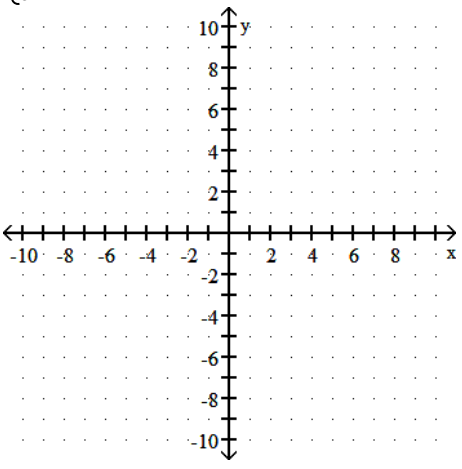
Simplify the rational expression.

19) $\frac{3x + 3}{15x^2 + 24x + 9}$ 19) _____

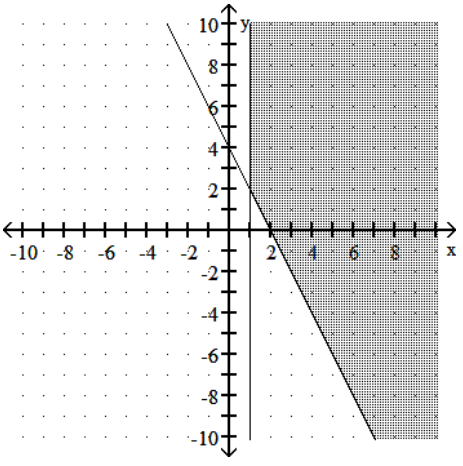
A) $\frac{3x + 5}{5x + 24}$ B) $\frac{1}{5x + 3}$ C) $\frac{3x}{5x + 3}$ D) $\frac{3x + 3}{15x^2 + 24x + 9}$

Graph the solution of the system of linear inequalities.

20) $\begin{cases} 2x + y \le 4 \\ y \le 1 \end{cases}$ 20) _____



A)



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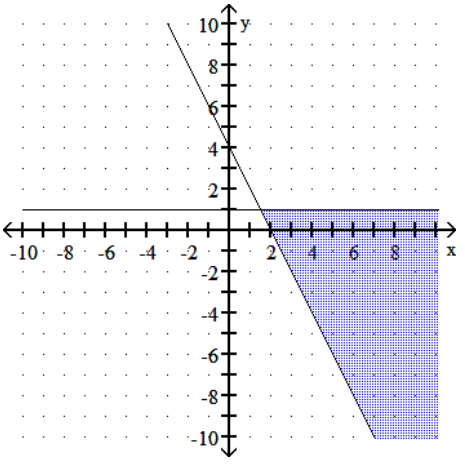

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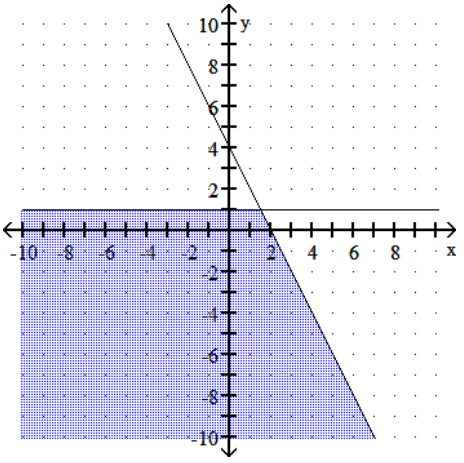
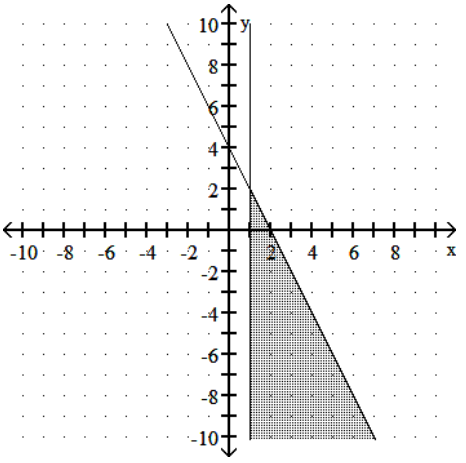


D)



Find an equation of the line through the pair of points. Write the equation in the form $Ax + By = C$.

21) $(-8, 1)$ and $(-3, -1)$ 21) _____

A) $-9x - 2y = -25$ B) $-2x - 5y = 11$ C) $9x + 2y = -25$ D) $2x - 5y = 11$

Solve by the most appropriate method.

22) $(2x - 1)(x + 6) = 99$ 22) _____

A) $-6, 5$ B) $-\frac{21}{2}, 5$ C) $-5, \frac{21}{2}$ D) $-6, \frac{1}{2}$

Simplify the expression. Write the result using positive exponents only.

23) $\frac{3^{-6}x^{-6}y^{4}}{3^{-3}x^{-9}y^{8}}$ 23) _____

A) $\frac{x^3}{27y^4}$ B) $\frac{3x^3}{y^4}$ C) $\frac{27}{x^3y^4}$ D) $\frac{1}{27x^9y^4}$

Evaluate the expression using exponential rules. Write the result in standard notation.

24) $\frac{1.6 \times 10^2}{0.2 \times 10^{-4}}$ 24) _____

A) 8,000,000 B) 0.08 C) 0.008 D) 800,000

Find the slope of the line that passes through the given points.

25) $(3, -17)$ and $(-6, 7)$ 25) _____

A) $-\frac{8}{3}$ B) $\frac{8}{3}$ C) $\frac{10}{3}$ D) $-\frac{3}{8}$

Perform the indicated operation. Assume that variables represent positive numbers.

26) $\sqrt{3x^2} - \sqrt[3]{32} - x\sqrt{27}$ 26) _____

A) $x^2\sqrt{3} - 2\sqrt[3]{4} - 3x\sqrt{3}$ B) $-2x\sqrt{3} - 8\sqrt[3]{4}$

C) $-2x\sqrt{3} - 2\sqrt[3]{4}$ D) $x^2\sqrt{3} - 8\sqrt[3]{4} - 3x\sqrt{3}$

Factor the polynomial completely. If the polynomial cannot be factored, write "prime."

27) $xy^2 + 4y^2 - 36x - 144$ 27) _____

A) $(x + 4)(y - 6)^2$ B) $(x + 4)(y^2 - 36)$

C) $(x - 4)(y + 6)(y - 6)$ D) $(x + 4)(y + 6)(y - 6)$

28) $6x^3 - 30x^2 + 36x$ 28) _____

A) $x(x + 3)(6x + 12)$ B) $6x(x - 3)(x - 2)$ C) $6x(x + 3)(x + 2)$ D) $x(6x + 3)(x + 2)$

29) $-rs^5 - r^5s$ 29) _____

A) $-rs(r^4 + s^4)$ B) $-rs(r - s)(r^4 + rs + s^4)$

C) $-rs(r + s)(r^4 - rs + s^4)$ D) $-rs(r - s)(r - s)$

30) $25 - m^2$ 30) _____

A) $(5 + m)^2$ B) prime C) $(5 - m)^2$ D) $(5 - m)(5 + m)$

Simplify the complex fraction.

31) $\dfrac{\frac{7}{a} + 7}{\frac{7}{a} - 7}$ 31) _____

A) $\dfrac{a^2}{7 - a^2}$ B) $7 - a^2$ C) $\dfrac{7(1 + a)}{1 - a}$ D) $\dfrac{1 + a}{1 - a}$

Solve the radical equation.

32) $\sqrt{7x - 4} = \sqrt{x + 9}$ 32) _____

A) $\dfrac{13}{7}$ B) $\dfrac{13}{6}$ C) $\dfrac{5}{6}$ D) $\dfrac{5}{8}$

Simplify the following. Indicate if the expression is not a real number.

33) $\sqrt[3]{-512}$ 33) _____

A) 8 B) -8 C) -64 D) 64

Perform the indicated operation and simplify if possible.

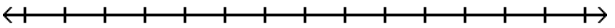
34) $\dfrac{x^2 - 16}{x^2 - 4x} \div \dfrac{x^2 + 5x + 1}{3x + 15}$ 34) _____

A) $\dfrac{3(x - 4)(x + 5)}{x(x^2 + 5x + 1)}$ B) $\dfrac{3(x + 4)(x + 5)}{x(x^2 + 5x + 1)}$

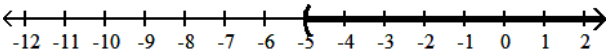
C) $\dfrac{(x + 4)(x^2 + 5x + 1)}{3x(x + 5)}$ D) $\dfrac{(x - 4)(x^2 + 5x + 1)}{3x(x + 5)}$

Solve the inequality. Graph the solution set and write it in interval notation.

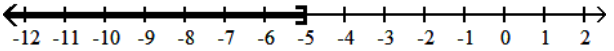
35) $3x - 4 \geq 2x - 9$ 35) _____



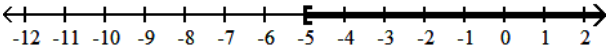
A) $(-5, \infty)$



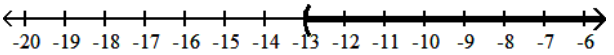
B) $(-\infty, -5]$



C) $[-5, \infty)$



D) $(-13, \infty)$



Simplify the radical expression. Assume that variables represent positive numbers.

36) $\sqrt{18x^8y^7}$ 36) _____

A) $3x^4y^3\sqrt{2y}$ B) $9x^8y^6\sqrt{2y}$ C) $9x^4y^3\sqrt{2y}$ D) $3x^4y^3\sqrt{2xy}$

Answer Key
Testname: 990

1) A
2) B
3) D
4) D
5) C
6) C
7) B
8) C
9) B
10) C
11) D
12) D
13) A
14) A
15) C
16) B
17) B
18) A
19) B
20) C
21) B
22) B
23) A
24) A
25) A
26) C
27) D
28) B
29) A
30) D
31) D
32) B
33) B
34) B
35) C
36) A