M-115 Cum Review

Simplify the expression.

1) $-10(5r + 7) + 7(9r + 3)$

Solve the problem.

2) Paul Nagel invested some money at 3.5% simple interest and $4000 more than that amount at 4.5% simple interest. After 1 year, his total interest from the two accounts was $740. How much did he invest at each rate?

Solve the equation.

3) $\frac{1}{3}(9x - 12) = \frac{1}{5}(20x - 15)$

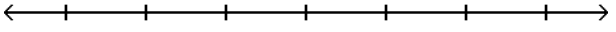
4) $-5x + 4(-3x - 7) = -36 - 9x$

Solve the problem.

5) A square plywood platform has a perimeter which is 8 times the length of a side, decreased by 24. Find the length of a side.

Solve the inequality. Write the solution set in interval notation and graph it.

6) $14x - 8 > 2(6x + 2)$

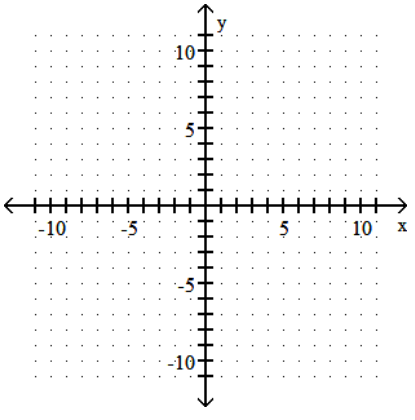


Find the slope of the line.

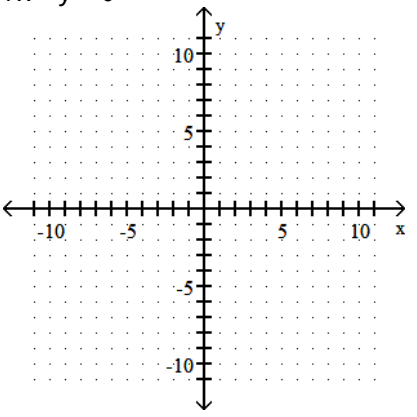
7) $-2y = 6 - 5x$

Graph the linear equation.

8) $8x = y - 5$



9) $7x - y = 0$

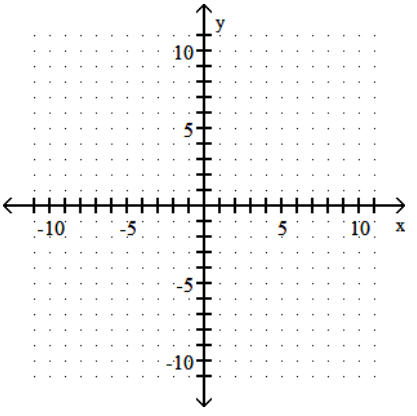


Determine whether the graphs of the equations are parallel lines, perpendicular lines, or neither.

10) $3x - 8y = -1$
$32x + 12y = -1$

Graph the linear equation by finding and plotting its intercepts.

11) $-x + 6y = 6$



Write the slope-intercept form of the equation for the line passing through the given pair of points.

12) $(-4, -9)$ and $(0, 2)$

Solve the problem.

13) A chemist has a 48% solution of alcohol to mix with a 84% solution to get 90 L of a final mixture that is 60% alcohol. How much of each of the original solutions should he use?

Solve the system by elimination (addition method).

14) $x + 9y = 9$
$3x - 8y = -8$

Solve the system by the addition method. If there is no solution or an infinite number of solutions, so state. Use set notation to express the solution set.

15) $\begin{cases} 7x - 2y = 6 \\ -21x + 6y = -24 \end{cases}$

Solve the system by the substitution method. If there is no solution or an infinite number of solutions, so state. Use set notation to express the solution set.

16) $\begin{cases} x + 2y = 2 \\ 9x + 3y = 3 \end{cases}$

17) $\begin{cases} 3x + y = 14 \\ 12x + 4y = 56 \end{cases}$

Find the product.

18) $(3x^2 + 5x + 5)(x^2 + 2x + 1)$

Subtract.

19) $(9n^7 - 9n^5 + 2) - (-19n^5 + 6n^7 + 8)$

Write the number in scientific notation.

20) 6,900,000

Find the product. Use the FOIL method.

21) $(5x - 4)(x + 10)$

Perform the division.

22) $\dfrac{-9x^9 - 18x^8 + 6x^6 - 9x^4}{-3x^6}$

23) $(p^2 + 2p - 43) \div (p + 8)$

Perform the indicated operation.

24) $(5x^4 - 8x^2 + x) - (6x^3 + 4x^2 + 2x) + (4x^2 - x)$

Factor the binomial completely. If it is prime, say so.

25) $343x^2 - 112$

26) $81s^2 - 121t^4$

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

27) $x^2 + 7x - 30$

Solve the equation.

28) $n^2 - 36 = 0$

Find the greatest common factor of the terms.

29) $64a^{10}b^3, 88a^6b^{10}$

Solve the problem.

30) One maid can clean the house in 6 hr. Another maid can do the job in 4 hr. How long will it take them to do the job working together?

Solve the rational equation.

31) $\dfrac{7x}{x + 4} - \dfrac{28}{x - 4} = \dfrac{7x^2 + 112}{x^2 - 16}$

32) $1 + \dfrac{1}{x} = \dfrac{30}{x^2}$

Add or subtract. Write the answer in lowest terms.

33) $\dfrac{a}{a^2 + 11a + 30} - \dfrac{1}{a^2 + 9a + 20}$

Simplify the radical. Assume that all variables represent nonnegative real numbers.

34) $\sqrt{405\,k^7q^8}$

Rationalize the denominator. Assume that all variables represent positive real numbers.

35) $\sqrt{\dfrac{36p^5s^2}{19r}}$

Solve the equation.

36) $x - 7 = \sqrt{4x - 7}$

Rationalize the denominator. Write the quotient in lowest terms.

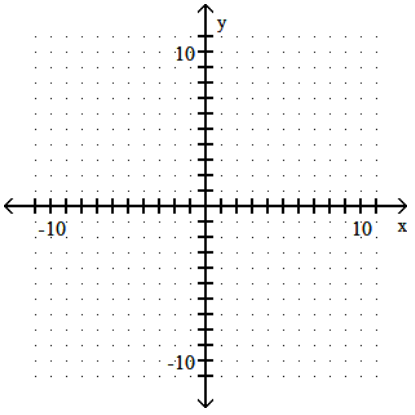
37) $\dfrac{\sqrt{5}}{5\sqrt{2} - \sqrt{5}}$

Perform the indicated operations. Assume that all variables represent nonnegative real numbers.

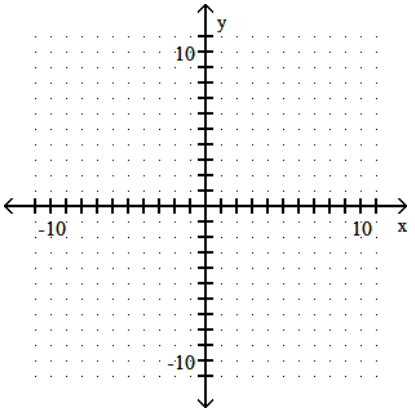
38) $\sqrt{2x} + 8\sqrt{8x} + 7\sqrt{32x}$

Graph the inequality.

39) $x + 2y < 5$

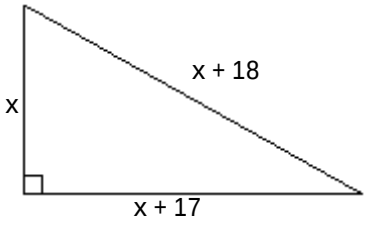


40) $5x + y > 5$



Solve the problem.

41) Find the lengths of the three sides of the right triangle.



Use the quadratic formula to solve the equation. Simplify any radicals.

42) $x^2 + 4x + 1 = 0$

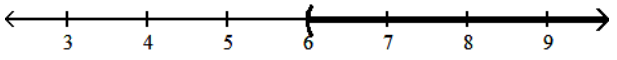
Solve.

43) $(3x + 4)^2 = 20$

Solve.

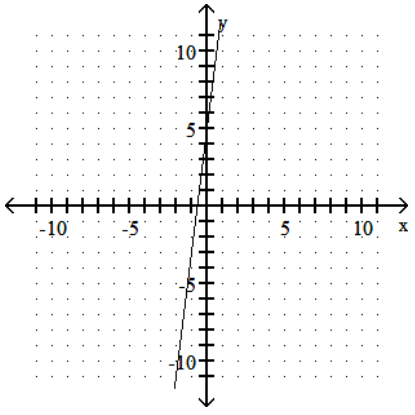
44) $z^2 + 18z = -58$

1) 13r - 49
2) $7000 at 3.5%; $11,000 at 4.5%
3) {-1}
4) {1}
5) 6
6) (6, ∞)

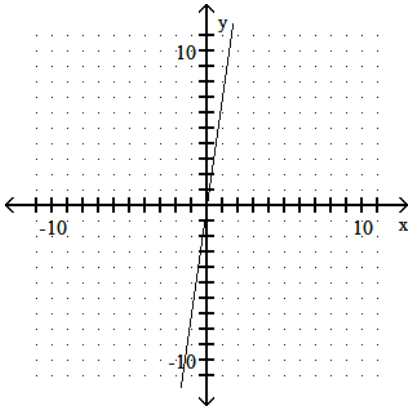


7) $\frac{5}{2}$

8)

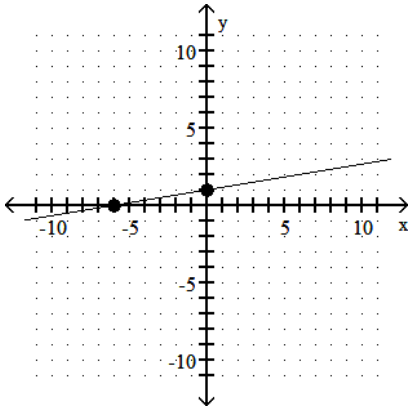


9)



10) Perpendicular

11)



12) $y = \frac{11}{4}x + 2$

13) 60 L of 48%; 30 L of 84%

14) {(0, 1)}

15) no solution; ∅

16) {(0, 1)}

17) infinitely many solutions; {(x, y)| 3x + y = 14} or {(x, y)| 12x + 4y = 56}

18) $3x^4 + 11x^3 + 18x^2 + 15x + 5$

19) $3n^7 + 10n^5 - 6$

20) 6.9×10^6

21) $5x^2 + 46x - 40$

22) $3x^3 + 6x^2 - 2 + \frac{3}{x^2}$

23) $p - 6 + \frac{5}{p + 8}$

24) $5x^4 - 6x^3 - 8x^2 - 2x$

25) 7(7x + 4)(7x - 4)

26) $(9s + 11t^2)(9s - 11t^2)$

27) (x + 10)(x - 3)

28) {-6, 6}

29) $8a^6b^3$

30) $2\frac{2}{5}$ hr

31) ∅

32) {-6, 5}

33) $\frac{x^2 - 7x + 32}{(x - 4)(x + 4)(x + 1)}$

34) $9k^3q^4\sqrt{5k}$

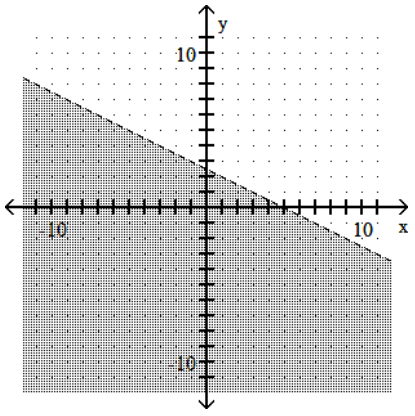
35) $\frac{6p^2s\sqrt{19pr}}{19r}$

36) {14}

37) $\frac{\sqrt{10} + 1}{9}$

38) $45\sqrt{2x}$

39)



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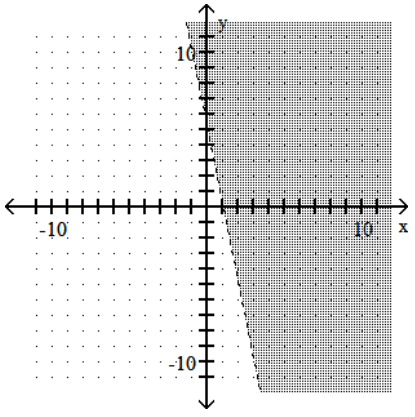

41) 7, 24, 25

42) $\{-2 \pm \sqrt{3}\}$

43) $\left\{\frac{-4 \pm 2\sqrt{5}}{3}\right\}$

44) $\{-9 \pm \sqrt{23}\}$