June 2011

Dear Parent and Student:

Providence High School's high quality of academic instruction provides great opportunities for success for our students. To that end, faculty strongly supports the idea of keeping a young mind busy with great ideas and curious learning, an ongoing process which translates later into success along with peace of mind of having accomplished your goal of sending your child or coming to Providence.

The purpose and benefit of the summer assignment is multifold. First, it allows the student to review previously known or familiar material in preparation for the fall semester. This directly translates into a better understanding of the new concepts being introduced by the teacher in the classroom. Setting the groundwork for this type of comfort in understanding is one of the primary reasons. Second, the academic performance challenges students to move to a higher learning curve and not just remain at average levels, an idea that I'm sure we all agree to be a win-win-win (parent-student-teacher) situation. Third, it allows students to enroll in higher level upper-division courses as they journey their four years of high school at PHS.

We have a responsibility to help you believe in this project with just one goal in mind- the personal and academic success of the student. This, along with the confidence to handle challenging, college-prep material is what we are all about, a college-prep school.

We hope you will support us in this assignment. The proof may not be visible today or tomorrow, but we can assure you that it is a project worth undertaking.

Thank you and have a great summer. Please access all information including "packet" content on the school's public website at www.providencehigh.org or on the Math Department page of the school portal by clicking in the Quick Launch Bar on "Summer Assignments"

You Belong Here.

ALGEBRA CONCEPTS AND APPLICATION

Summer Math Skills

Pre-requisite for Honors Algebra II

Name _____ Date _____

This summer Algebra packet has been prepared for all students registered in Honors Algebra II. These exercises will give you practice and will help you keep your Math skills "sharpened".

The answers to these problems will be provided the first week of classes in September.

These solved exercises will be collected the first week of class and you will be quizzed on them.

Find the prime factorization of each integer.

1. 140
2. 198
3. 89
4. 756
5. 441
6. 203
7. 2548
8. 3861

Find (a) the GCF and (b) the LCM of the following monomials.

9. 20, 35
10. 45, 75
11. -48, 108
12. 315, -525
13. 84, -56, 140
14. 168, 280, 196
15. 3, 5, 7, 9
16. 30, 35, 36, 42
17. $9p^3q$, $15p^2$
18. $49x^3$, $35x^2y$
19. $68xy^2z$, $51y^2z^2$
20. $52r^2s$, $78rs^2t$
21. $110h^3k^2r$, $-88h^2k^2r^2$
22. $98a^2b^2c$, $-70abc^2$
23. $14ab$, $14bc$, $21ac$
24. $22xy^2z^2$, $33x^2yz^2$, $44x^2yz$
25. $26p^3q^2r^2$, $39p^2q^3r^2$, $78p^2q^2r^3$
26. $200a^3b^2c$, $300a^2bc^3$, $400ab^3c^2$

Factor each polynomial.

1. $16x^3 - 64x^2$
2. $6x^2y^2 + 8x^3y$
3. $t^2 + 18t + 81$
4. $z^2 - 12z + 36$
5. $16k^2 - 1$
6. $121x^2 - 1$
7. $4y^2 + 20y + 25$
8. $9s^2 - 24s + 16$
9. $16x^2 - 25$
10. $4h^2 - 81$
11. $121s^2 - 66st + 9t^2$
12. $16x^2 + 40xy + 25y^2$
13. $36p^2 - 49q^2$
14. $9x^4 - 16z^2$
15. $st^2 - s$
16. $p^3q - pq$
17. $t^3 - 27$
18. $8p^3 + 1$
19. $16r^4s + 2rs^4$
20. $3x^2y^4 - 81x^2y$
21. $x(y - 3) + 2(y - 3)$
22. $u(v - 1) - 2(v - 1)$
23. $x(y - 3) + 2(3 - y)$
24. $u(v - 1) - 2(1 - v)$
25. $pq - 2q + 2p - 4$
26. $xy - 2y - x + 2$
27. $ab - 2 - 2b + a$
28. $4ab + 1 - 2a - 2b$
29. $x^2 - 6x + 9 - 4y^2$
30. $z^2 + 2z + 1 - w^2$
31. $u^2 - v^2 + 2v - 1$
32. $x^2 - y^2 - 4y - 4$
33. $x^4 - 2x^2y + y^2$
34. $4u^4v^2 + 4u^2v + 1$
35. $a^6 + b^3$
36. $250x^2 - 2x^5$
37. $16s^4 - 81$
38. $p^4 - q^4$
39. $x^6 - y^6$
40. $64 - z^6$
41. $u^2 - v^2 - 2u - 2v$
42. $a^2 - b^2 + a - b$
43. $(p + q)^3 - (p - q)^3$
44. $(x + y)^3 + (x - y)^3$
45. $s^3 + t^3 + s^2t + st^2$
46. $u^3 - v^3 - u^2v + uv^2$
47. $(a + b)^6 - (a - b)^6$
48. $(a + b)^4 - (a - b)^4$

Find an equation in standard form of the line containing point P and having slope m.

1. $P(2, 3)$, $m = 1$
2. $P(2, 1)$, $m = -1$
3. $P(5, 0)$, $m = -2$
4. $P(-1, 4)$, $m = 0$
5. $P(-3, -2)$, $m = \frac{1}{2}$
6. $P(2, 1)$, $m = \frac{2}{3}$
7. $P(4, -3)$, $m = \frac{1}{5}$
8. $P(0, 6)$, $m = -\frac{3}{2}$
9. $P(-2, -1)$, $m = 0$
10. $P(-3, 3)$, $m = -\frac{4}{3}$
11. $P(-2, 4)$, $m = 0.4$
12. $P(4, 0)$, $m = -0.6$

Find an equation in standard form of the line having slope m and y-intercept b.

13. $m = -1$, $b = 2$
14. $m = 1$, $b = -3$
15. $m = \frac{1}{2}$, $b = \frac{3}{2}$
16. $m = -\frac{3}{4}$, $b = -\frac{5}{4}$
17. $m = 1.2$, $b = -0.6$
18. $m = -0.8$, $b = 1.4$

Find an equation in standard form of the line containing the given points.

19. $(0, 0)$, $(5, -2)$
20. $(0, 0)$, $(-3, 1)$
21. $(3, -2)$, $(-2, 3)$
22. $(3, -2)$, $(2, -3)$
23. $(3, -2)$, $(-3, 2)$
24. $(3, -2)$, $(-3, -2)$
25. $(-2, 3)$, $(-2, -3)$
26. $(4, -5)$, $(1, -4)$
27. $\left(-3, \frac{1}{2}\right)$, $\left(3, \frac{1}{2}\right)$
28. $\left(\frac{3}{2}, -\frac{1}{2}\right)$, $\left(-\frac{1}{2}, \frac{5}{2}\right)$
29. $\left(\frac{2}{3}, -\frac{1}{2}\right)$, $\left(\frac{1}{6}, -1\right)$
30. $\left(\frac{3}{4}, \frac{5}{4}\right)$, $\left(-\frac{1}{4}, \frac{1}{2}\right)$

Find an equation in standard form for the line described.

39. Passing through the points $(1, 4)$ and $(-3, 4)$
40. Passing through the points $(-2, 3)$ and $(-2, 6)$
41. Passing through the origin and with no slope
42. Passing through the origin and with slope 0
43. Having y-intercept 6 and parallel to the x-axis
44. Having x-intercept -4 and parallel to the y-axis
45. Having x-intercept 4 and y-intercept 3
46. Having x-intercept -3 and y-intercept -1
47. Through $P(-2, 1)$ and parallel to the line containing $(1, 4)$ and $(2, 3)$
48. Through $Q(-3, 2)$ and parallel to the line containing $(2, 3)$ and $(1, -2)$

Graph the line through point P having slope m. Find the coordinates of two other points on the line.

25. $P(0, 2)$, $m = 1$
26. $P(1, 0)$, $m = -1$
27. $P(3, -1)$, $m = -2$
28. $P(-2, -1)$, $m = 3$
29. $P(2, -3)$, $m = \frac{1}{2}$
30. $P(0, 3)$, $m = -\frac{3}{2}$
31. $P(-2, 3)$, $m = -\frac{2}{3}$
32. $P(-1, -4)$, $m = \frac{5}{3}$
33. $P(0, 0)$, $m = 0.25$
34. $P(-3, -1)$, $m = 0.75$
35. $P(2, 1)$, $m = 0$
36. $P(2, 1)$, no slope

Solve.

38. A jetliner covered a horizontal distance of 5 mi while following a flight path with slope 0.25. How much altitude did it gain?

Find the value of k so that the given line has slope m.

39. $kx - 3y = 7$, $m = 2$
40. $6x + ky = 10$, $m = -2$
41. $(k + 3)x - 3y = 1$, $m = k$
42. $(k + 1)x + 2y = 6$, $m = k - 2$

Find the value of k so that the line through the given points has slope m.

43. $(2k, 3)$, $(1, k)$; $m = 2$
44. $(k, k + 1)$, $(3, 2)$; $m = 3$
45. $(k + 1, k - 1)$, $(k, -k)$; $m = k + 1$
46. $(k + 1, 3 + 2k)$, $(k - 1, 1 - k)$; $m = k$
47. $(3, k)$, $(-1, |k|)$; $m = -2$
48. $(1, k)$, $(5, |k|)$; $m = 3$

Exercises 49–54 outline a proof of the theorem stated on page 114.

49. Show that the graph of the equation $y - y_1 = m(x - x_1)$ is a line L by expressing the equation in the form $Ax + By = C$.
50. Explain how you know L passes through $P(x_1, y_1)$.
51. Explain how you know L has slope m.

Exercises 49–51 showed that there is *at least one* line through P having slope m. Now let L' be *any* line through P having slope m.

52. Let $Q(x', y')$ be any point of L' different from $P(x_1, y_1)$. Explain why $\frac{y' - y_1}{x' - x_1} = m$.
53. From Exercise 52, $y' - y_1 = m(x' - x_1)$. Explain why this shows that $Q(x', y')$ is on L.
54. Explain why L' and L must be the same line.

Therefore, there is *only one* line through P having slope m.

Complete the ordered pair to form a solution of the given equation.

1. $2x + y = 5$; $(4, \_?\_)$
2. $x - 3y = 7$; $(\_?\_, -2)$
3. $-x + 4y = 9$; $(-1, \_?\_)$
4. $5x + 2y = -8$; $(\_?\_, 1)$

Simplify, arranging terms in order of decreasing degree of x. Then write the degree of the polynomial.

1. $2 - x^2 + 3x + 2x^2 - 5x$
2. $x^3 - 4x + 7x^2 + 3 + 2x$
3. $-x^2 + 3x^3 - 3x + x^2 + 2x$
4. $2x^3 - 7 + 5x^2 - x^3 + 3x - x^3$
5. $x^2y^2 - x^2 + 3x^2y^2 + 5xy^2 - 2x^2$
6. $4x^2y^3 - xy^2 + 2x^3y - 2xy^2$
7. $4x^2yz^3 - xyz + 2x^2yz^3 + 5x^3y^2z^2$
8. $7xy^2z^3 - 4xy^2z^3 + 2x^2yz^2 - 3xy^2z^5$

In Exercises 9–16, (a) add the polynomials and (b) subtract the second polynomial from the first.

9. $5m - 4,\ 2m + 3$
10. $3u + 7,\ u - 8$
11. $t^2 - 8t - 7,\ t^2 + 5t - 6$
12. $2n^2 - n + 5,\ n^2 + 1$
13. $5v^3 - 2v + 1,\ v^2 + 2v - 2$
14. $w^3 - w^2 + w - 1;\ 1 - w - w^2 - w^3$
15. $3x^2 - 2xy + 4y^2,\ 2x^2 + 3y^2$
16. $4a^2 + 3ab - b^2,\ b^2 - 2ab$

Simplify.

17. $3(x^2 - 2x + 4) + 2(5x^2 - 7)$
18. $4(3y^2 - 2y) + 3(y^2 + 5y - 1)$
19. $2(4m^2 + 3) - 7(m^2 - 2) + 1$
20. $5(2n^2 - 3) - 2(5n^2 + 2) - 6$
21. $4a(x - y) + 3a(x + y) + ay$
22. $2d(3m + n) - 5d(m - 4n) - 10dm$
23. $3[2p^2 - q(3p + 4q)] - 2[4q^2 - 3p(p - 2q)]$
24. $4[2a(3a - b) + 3ab] + 5[3b(a + 2b) - 4ab]$

Find values of a, b, c, and d that make the equation true.

25. $(4t^3 - at^2 - 2bt + 5) - (ct^3 + 2t^2 - 6t + 3) = t^3 - 2t + d$
26. $(ax^3 - 3x^2 + 2bx - 2) - (2x^3 - cx^2 - 5x - 4d) = x^2 + x - 6$
27. $(x^2 + ax + 2b) + (x^2 - 2bx + 3a) = cx^2 - 7x + 3$

Find an equation of the form $f(x) = mx + b$ for the linear function f.

1. $m = -2;\ f(4) = -6$
2. $f(0) = 5;\ f(2) = 7$
3. $f(-1) = 3;\ f(3) = 1$

[redacted] the line containing the given points, find (a) the slope and (b) an [redacted]tion in standard form.

4. $(0, 4), (4, 0)$
5. $(-3, 1), (5, 3)$
6. $(0, 0), (-3, 2)$
7. $(6, -5), (-2, 1)$
8. $(-4, 7), (1, 9)$
9. $(-2, 5), (3, 5)$

Simplify. Assume that variable exponents represent positive integers.

1. $3z^2 \cdot 2z^3$
2. $5r^2 \cdot r^4$
3. $(-t^4)^3$
4. $(-t^3)^4$
5. $(3x^2y)(xy^2)$
6. $(4p^2q)(p^2q^3)$
7. $(-2u^2)(uv^3)(-u^2v^2)$
8. $(r^2s)(-3rs^3)(2rs)$
9. $(4a^3b^2)^2$
10. $(2c^2d^3)^3$
11. $(-3pq^4r^2)^3$
12. $(-x^2yz^3)^4$
13. $(-z^3)(-z)^3$
14. $(-c)^2(-c^4)$
15. $(s^2t)^3(st^3)^2$
16. $(2x^2y^3)^3(3x^3y)^2$
17. $3y(y^3 - 2y^2 + 3)$
18. $x^2(x - 2x^2 + 3x^3)$
19. $rs^2(r^2 - 2rs - s^2)$
20. $p^2q^3(p^2 - 4q)$
21. $z^{n-2} \cdot z^{n+2}$
22. $t^4 \cdot t^{k-4}$
23. $x^{m-n} + x^t \cdot x^m$
24. $y^{p+2} \cdot y^p \cdot y^{p-2}$
25. $r^{h-2}(r^{h+1})^2$
26. $s^3(s^{2k-1})^3$
27. $t(t^{n-1} + t^n + t^{n+1})$
28. $x^2(x^k - x^{k-1} + x^{k-2})$
29. $p^n(p^{m-n+1} + p^{m-n})$
30. $s^{2n}(s^{2m-n} - s^{m-2n})$
31. $z^{m-n}(z^{n+m} - z^{n-m} + z^n)$
32. $x^{h+k}(x^{2h-k} - x^{h-2k} + x^k)$
33. $(t^m)^n(t^n)^{n-m}$
34. $(y^{h-k})^h(y^{h+k})^k$

In Exercises 35–38, solve for n.

35. $3^{5n} = 3^5(3^{2n})^2$
36. $(2^{3n})^2 = (2^n)^3 \cdot 2^{n+6}$
37. $3 \cdot 9^{2n} = (3^{n+1})^3$
38. $4^{n+3} \cdot 16^n = 8^{3n}$
39. Prove the first law of exponents.
40. Prove the third law of exponents.
41. Prove that for positive integers m, n, and r, $((a^m)^n)^r = a^{mnr}$.
42. Prove that for positive integers m and n, $(a^m)^n = (a^n)^m$.

Multiply.

1. $(3v + 1)(2v - 5)$
2. $(2x - 3)(3x + 2)$
3. $(4z + 3)(3z - 4)$
4. $(r - 4)(3r - 2)$
5. $(3x + 10)^2$
6. $(4k - 5)^2$
7. $(5y - 2)(5y + 2)$
8. $(2s + 7)(2s - 7)$
9. $(7t + 2)(2t - 1)$
10. $(5z + 6)(6z - 5)$
11. $(9t + 1)(1 - 9t)$
12. $(9 - 5t)(5t - 9)$

Multiply. Assume that variable exponents represent positive integers.

13. $(x - 2y)(3x + 4y)$
14. $(5h - 3k)(h - 2k)$
15. $(2p + 3q)(3p - 2q)$
16. $(10r - 3s)(r + 2s)$
17. $(x^2 - 3)(x^2 + 3)$
18. $(p^2 - 2q^2)(p^2 + 2q^2)$
19. $(s^3 + t^3)^2$
20. $(2z^2 - 5)^2$
21. $t(t - 2)(t + 1)$
22. $x^2(x - 3)(x + 3)$
23. $xy(x - y)^2$
24. $mn(m - n)(m - 2n)$
25. $(2c + 1)(c^2 - 3c + 2)$
26. $(t - 3)(2t^2 - t + 2)$
27. $(x^2 + 3x - 5)(x + 2)$
28. $(z^2 - 2z + 4)(z + 3)$
29. $(y^4 - 3y^2 + 1)(y^2 - 2)$
30. $(3 - k^2)(2 - k^2 - k^4)$
31. $(x^2 - x + 2)(x^2 + x - 1)$
32. $(y^2 - 2y + 1)(y^2 + y + 1)$
33. $(a + 2b)(a^3 - 2a^2b - b^3)$
34. $(3s + 2t)(s^3 - 3st^2 + 2t^3)$
35. $(p^n - 1)^2$
36. $(x^{2n} - y^n)^2$
37. $(r^n - s^n)(r^n + 2s^n)$
38. $(x^n + 1)(x^n - 1)$
39. $(a - b)^3$
40. $(a + b)^3$
41. $(a + b)(a^2 - ab + b^2)$
42. $(a - b)(a^2 + ab + b^2)$
43. $(a - b)(a^3 + a^2b + ab^2 + b^3)$
44. $(a + b)(a^3 - a^2b + ab^2 - b^3)$
45. $(x + y)(x - y)(x^2 + y^2)$
46. $(x + y)^2(x - y)^2$
47. $(x^2 + 2x + 2)(x^2 - 2x + 2)$
48. $(x^2 - 4x + 8)(x^2 + 4x + 8)$

Without actually finding the product, determine how many terms the simplified product has.

49. $(u + v)(x + y)(u - v)(x - y)$
50. $(u + v + w)(x + y + z)$
51. $(u + v + w)(u + v - w)$
52. $(x - y + z)(x + y + z)$

Find the value or values of k that make the equation true.

53. $(x + 2k)(x - 3k) = x^2 + 2x - 24$
54. $(2x + k)(x - 2k) = 2x^2 + 9x - 18$
55. $(2x - k)(3x + 2k) = 6x^2 + kx - 32$
56. $(3kx + 2)^2 = 81x^2 + 12kx + 4$

Simplify.

1. $(3x^2 - 7x + 9) - (x^2 + 4x - 1)$
2. $(a^2b^3)^3$
3. $(4m^2n)(-3mn^3)$
4. $5(2y - 1) - 3(y + 2)$
5. $2c(d - 3) + 3d(c + 4)$
6. $4p(2p^2 - p + 5)$
7. $(-u^2)^4(-u)^3$
8. $(9z^3 - 4z) + (5z^2 - 8)$
9. $(y^2 - 5y + 9) - (9 + 5y + y^2)$
10. $\left(-\frac{1}{2}x^2\right)(-4x^4)$

Simplify.

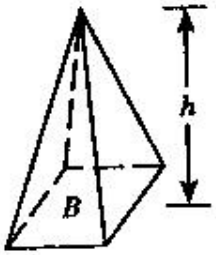
1. $7 - (3 - 4)$
2. $-2(-5 + 8)$
3. $(4 - 9)^2$
4. $|-6 + 2|$
5. $(-8)\left(\frac{1}{2}\right)(-3)(-1)$
6. $\frac{-3 + 11}{-1 - 3}$
7. $3x - 2(x + 4)$
8. $(-4a)(5b) + (-3a)(-8b)$
9. $(-x)^2(-y)^3$
10. $2(c - 3d) + 5(2d - c)$
11. $-3 + \frac{1}{2}(6 - 10x) + 5x$
12. $\frac{1 - m}{-1}$

Express each answer in simplest form in terms of the given variable.

1. A rectangular garden that is w ft wide is enclosed by 120 ft of fencing. How long is the garden?
2. The perimeter of an isosceles triangle is 300 cm, and its base is b cm long. How long is each leg?
3. In a basketball game, one team's score is two points less than half the other team's score, which is x. What is the difference in the scores?
4. Dan has y cassette tapes. If he had 15 more tapes, he would have half the number his brother has. How many tapes does his brother have?
5. The length and the width of a rectangle are consecutive even integers, and the length is l cm. Find **(a)** the area and **(b)** the perimeter of the rectangle.

8. A bus traveled for 2 h at r mi/h, then decreased the speed by 10 mi/h and traveled for 1 more hour. How far did the bus go?
9. One angle of a quadrilateral has measure $a°$. Find the average of the measures of the other three angles. (*Hint:* The sum of the measures of the angles of a quadrilateral is 360°.)
10. An angle has measure $x°$. Find the average of the measures of a complement and a supplement of the angle.

In Exercises 11 and 12, use the fact that the volume V of a pyramid is given by $V = \frac{1}{3}Bh$, where B is the area of the base and h is the height.



11. A pyramid has height x cm and a *square base* whose edges are 3 cm less than twice the height. Find the volume.
12. A pyramid has a *rectangular base*. Find the volume if the length and width of the base and the height are three consecutive odd integers and x is the largest integer.

13. The Drama Club sold t students' tickets at \$1.50 each and 100 fewer adults' tickets at \$2.50 each. How much money did the club collect?

14. Jorge bought s 40-cent stamps and three times as many 25-cent stamps. How many dollars did he spend?

15. Jessica's bank contains 18 quarters and dimes, of which q are quarters. Find the total value of the coins in dollars.

16. The length of a rectangular field is 45 ft greater than its width, w ft. How much fencing is needed to enclose the field and divide it into two parts as shown?

choose a variable to represent an unknown number, and then write an equation to describe the given situation.

17. A quadrilateral has perimeter 60 cm, and the lengths of its sides (in centimeters) are consecutive odd numbers.

20. Lupe swims two fewer laps than Mary. If both added seven laps to their daily swims, the sum of their laps would be three times as many as Mary now swims.

21. Max has twice as much money as Katy, who has \$12 more than Greg. All three together have \$124.

22. Paula's purse contains twice as many dimes as quarters and three fewer nickels than dimes. The total of these coins is \$3.15.

23. A car and a truck left Elton at noon and traveled in opposite directions. The truck's speed is two thirds of the car's speed, and the vehicles are 140 mi apart at 2 P.M.

24. Tom and Tina set out on their bikes at noon and travel toward each other, meeting at 2:30 P.M. Tina's speed is 4 mi/h faster than Tom's speed, and their starting points are 50 mi apart.

25. In quadrilateral $ABCD$, the measure of $\angle A$ exceeds the measure of $\angle B$ by 20°. Also, the measure of $\angle D$ is twice the measure of $\angle B$ and half the measure of $\angle C$.

26. In an equilateral triangle, the length of one side is 20 cm more than one third the length of another.

27. A grocer mixed cashews and almonds to produce 20 kg of mixed nuts worth \$7.80/kg. Cashews are worth \$7/kg, and almonds are worth \$9/kg.

28. When the Kims went to the ball game, they bought two adults' tickets and three children's tickets. A child's ticket cost \$1.50 less than an adult's, and the family's average price per ticket was \$3.35.

29. Kevin drove 320 mi to a mountain resort. His return trip took 20 min longer because his speed returning was 4 mi/h slower than his speed going.

17. $3(x-2)-x=2(2x+1)$

18. $\frac{2}{5}(x-2)=x+4$

19. $2z-(1-z)=11-z$

20. $3(1-t)+5=3(1+t)-7$

21. $2(5t-3)-t=3(3t-2)$

22. $3(5z-1)+5(3z+2)=7$

23. $\frac{6x-2(x-4)}{3}=8$

24. $\frac{3y-2(y-1)}{6}=-1$

Tell whether each number at the right of the given equation is a solution of the equation.

25. $x(x-3)(x+2)=0;\ -2,\ -3$

26. $z(z+1)(z-2)=0;\ 0,\ -1$

27. $z^3-4z^2+z+6=0;\ 2,\ 3$

28. $u^3-7u-6=0;\ 1,\ -2$

29. $\frac{x+12}{x-4}=x-3;\ -2,\ 0$

30. $\frac{2y}{2y-1}=\frac{y+2}{y+1};\ 0,\ 2$

Solve the equation for the given variable.

31. $2x-5y=10$ for x

32. $A=\frac{1}{2}bh$ for h

33. $I=prt$ for p

34. $C=2\pi r$ for r

35. $y=mx+b$ for x

36. $ax+by=c$ for y

37. $P=2l+2w$ for w

38. $P=2(l+w)$ for l

39. $a(x-b)=c+ab$ for x

40. $5cy-d=4d-cy$ for y

41. $S=-\frac{1}{2}gt^2+vt$ for v

42. $C=\frac{5}{9}(F-32)$ for F

In each formula, substitute the given values of the variables. Then find the value of the remaining variable, which is printed in red.

43. Volume of a cylinder: $V=\pi r^2h;\ V=128,\ r=8$

44. Volume of a cone: $V=\frac{1}{3}\pi r^2h;\ V=48,\ r=4$

45. Amount at simple interest: $A=P(1+rt);\ A=168,\ P=150,\ r=0.08$

46. Distance an object falls: $d=\frac{v^2}{2g};\ d=1000,\ v=140$

47. Area of a trapezoid: $A=\frac{h}{2}(b_1+b_2);\ A=100,\ h=5,\ b_2=12$

1. Name the property that justifies each step in the simplification below.

$\frac{1}{2}[(x+2)+(-x)] = \frac{1}{2}[-x+(x+2)]$ a. ?

$= \frac{1}{2}[(-x+x)+2]$ b. ?

$= \frac{1}{2}(0+2)$ c. ?

$= \frac{1}{2} \cdot 2$ d. ?

$= 1$ e. ?

Simplify.

2. $-6 + 13 + (-5)$
3. $-11 + (-8) + 9$
4. $7 + (-4) - (-5)$
5. $-3.2 - (4.6 - 5)$
6. $-3(2-7) + 4(-6)$
7. $(-6c)(4d)\left(-\frac{1}{8}\right)$
8. Evaluate the expression $2x^2 - 5x - 8$ if $x = -3$.

Simplify.

9. $24 \div (-6) \div (-2)$
10. $\frac{4(-8) - 3(-4)}{(-5)(-2)}$
11. $\frac{-6x^2 + 10x - 2}{-2}$
12. Evaluate the expression $\frac{y+9}{(y-1)(3-y)}$ if $y = -1$.

Solve. Check your work when there is a single solution.

1. $3x - 4 = 5$
2. $4z + 11 = 3$
3. $\frac{2}{3}t - 8 = 0$
4. $15 - \frac{1}{8}d = -1$
5. $5r = 18 + 2r$
6. $24 - 2y = 6y$
7. $3(t-1) = -(t-5)$
8. $2(x-3) = x + 3$