1. $21^2 = ?$
   a) 4,582
   b) 9,274
   c) 441
   d) 42

2. $24^3 = ?$
   a) 13,824
   b) 1,256
   c) 72
   d) 2400

3. $\frac{10}{5} \bullet \frac{3}{8} = ?$
   a) 0.35
   b) 0.50
   c) 0.65
   d) 0.75

4. If $A = \frac{CD}{B}$, then B = ? and C = ?
   a) $\frac{CD}{A}$ and $\frac{D}{AB}$
   b) $\frac{AC}{D}$ and BCD
   c) $\frac{CD}{A}$ and $\frac{AB}{D}$
   d) $\frac{A}{CD}$ and $\frac{AB}{D}$

5.

If C=AB, then A = ? and B = ?

a) BC and AC

b) $\frac{B}{C}$ and $\frac{A}{C}$

c) $\frac{B}{C}$ and $\frac{C}{A}$

d) $\frac{C}{B}$ and $\frac{C}{A}$

6.

If $AB = \frac{CD}{E^2}$, then A = ? and E = ?

a) $\frac{CD}{E^2 B}$ and $\left(\frac{CD}{AB}\right)^2$

b) $\frac{CD}{BE^2}$ and $\sqrt{\frac{CD}{AB}}$

c) $\frac{BE^2}{CD}$ and $\sqrt{\frac{CB}{AD}}$

d) $\frac{CD}{BE^2}$ and $\left(\frac{AB}{CD}\right)^2$

7.

If $55 = \sqrt[3]{\frac{x}{2}}$, then x = ?

a) 332,750

b) 110,000

c) 605,000

d) 18,150

8. If x = 120, then $\sqrt{x}$ = ?
   a) ≈10.954
   b) ≈14,400
   c) ≈±10.954
   d) ≈±11.203

9. log 2500 = ?
   a) 2.4
   b) 2.5
   c) 7.82
   d) 3.4

10. log 0.00025 = ?
   a) -3.6
   b) -2.5
   c) -0.25
   d) 25

11. antilog 4.35 = ?
   a) 0.64
   b) 43,500
   c) 22,387
   d) 1.47

12. antilog -4.35 = ?
   a) 4,350
   b) 0.0000447
   c) 0.0000435
   d) 0.00435

13. the natural log of 1,000 = ?
    a) 3
    b) 20.08
    c) 6.91
    d) 26.88

14. the anti-natural log of 0.0039 = ?
    a) 1.004
    b) -5.55
    c) -2.41
    d) 1.009

15. $-3x + 4 = 22$ Solve for x.
    a) 26
    b) -6
    c) 6
    d) 33

16. $19 = 2x + 4y$ Solve for x.
    a) $\frac{19 - 4y}{2}$
    b) $\frac{7.5}{y}$
    c) $\frac{y}{7.5}$
    d) 36y

17. 5x-4+3x=12 Solve for x.
    a) 4
    b) 3
    c) 2
    d) 1

18. $5x^2 - 3x + 7 = 19$ Solve for x.
    a) 17 or 2.8
    b) 3 or -1
    c) -12 or -28
    d) 1.9 or -1.3

19. x+y = 9 and 3x-2y = 7 Solve for x and y.
    a) x = 4y, y = $\frac{x}{4}$
    b) x = -4, y = -5
    c) x = 4, y = 5
    d) x = 5, y = 4

20. $x^2 + y = 16$, and $\frac{3x^2}{2y} = 3$. Solve for x and y.
    a) y = 1.76, x = -3.27 and y = ∓ 3.76 and x = -2.125
    b) y = 5.333, $x = \pm 3.266$
    c) y = 7, $x = \pm 31.266$
    d) y = ± 31.28, $x = \pm 37.06$

ALGEBRA & GEOMETRY ANSWERS

1. The correct answer is c) because 21^2 = 21x21, which is the same as 441

2. The correct answer is a) because 24^3 = 24x24x24, which is the same as 13,824

3. The correct answer is d) because $\frac{10}{5} \bullet \frac{3}{8} = \frac{30}{40} = \frac{3}{4} = 0.75$

4. The correct answer is c) because $A = \frac{CD}{B}$ was the original equation. To obtain B, multiply both sides by B. This gives AB=CD. Then divide both sides by A. This gives $\frac{CD}{A}$. To obtain C, multiply both sides by B. This gives AB=CD. Then divide both sides by D. This gives $\frac{AB}{D}$.

5. The correct answer is d) because C=AB was the original equation. To obtain A, divide both sides by B. This gives $\frac{C}{B}$. To obtain B, divide both sides by A. This gives $\frac{C}{A}$.

6. The correct answer is b) because $AB = \frac{CD}{E^2}$ was the original equation. To obtain A, divide both sides by B. This gives $A = \frac{CD}{BE^2}$. To obtain E, multiply both sides by E^2. This gives $ABE^2 = CD$. Then divide both sides by AB. This gives $E^2 = \frac{CD}{AB}$. Finally, take the square root of both sides $\sqrt{E^2} = \sqrt{\frac{CD}{AB}}$ or $E = \sqrt{\frac{CD}{AB}}$.

7. The correct answer is a) because $55 = \sqrt[3]{\frac{x}{2}}$ was the original equation. To obtain x, cube both sides. This gives $55^3 = \frac{x}{2}$ or $166{,}375 = \frac{x}{2}$. Next, multiply both sides by two. This gives x = 332,750.

8. The correct answer is c) because any even root ($\sqrt{x}, \sqrt[4]{x}, \sqrt[6]{x}$, etc.) can be either positive or negative. In this case, 10.95445 times 10.95445 is the same (positive 120) as -10.95445 times -10.95445.

9. The correct answer is d) because $10^{3.4} \approx 2{,}500$. Thus, the log of 2,500 is 3.4.

10. The correct answer is a) because $10^{-3.6} \approx 0.00025$. Thus, the log of 0.00025 is -3.6.

11. The correct answer is c) because $10^{4.35} \approx 22{,}387$. Thus, the antilog of 4.35 is 22,387

12. The correct answer is b) because $10^{-4.35} \approx 0.0000447$. Thus, the antilog of -4.35 is 0.0000447.

13. The correct answer is c) because $e^{6.91} = 1{,}000$. Thus, the natural log of 1,000 is 6.91. ("e", which equals 2.718281828…, is a button on your scientific calculator.)

14. The correct answer is a) because $e^{0.0039} = 1.004$. Thus, the anti-natural log of 0.0039 is 1.004.

15. The correct answer is b) because 4 must be subtracted from both sides. This gives $-3x = 18$. Next, divide both sides by -3. This gives $x = \frac{18}{-3}$, or x = -6.

16. The correct answer is a) because 4y must be subtracted from both sides. This gives $19-4y=2x$. Next, divide both sides by 2. This gives $x=\frac{19-4y}{2}$.

17. The correct answer is c) because the x terms must be combined on the left of the equation. This gives 8x-4=12. Next 4 must be added to both sides. This gives 8x=16. Finally, both sides must be divided by 8. This gives x = 2.

18. The correct answer is d) because $5x^2-3x+7=19$ was the original equation. First, 19 must be subtracted from both sides. This gives $5x^2-3x-12=0$. Next, apply the quadratic equation: $x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$, where "a" is the value of the x^2 multiplier, "b" is the value of the x multiplier, and "c" is the non-x value. In this case, a = 5, b = -3, and c = -12. Plug these values into the quadratic equation: $x=\frac{-(-3)\pm\sqrt{(-3)^2-4(5)(-12)}}{2(5)}$. This simplifies to: $x=\frac{3\pm\sqrt{9+240}}{10}$. Simplifying again: $x=\frac{3\pm16}{10}$, or $x=\frac{19}{10}$ and $x=\frac{-13}{10}$. Thus, x = either 1.9 or -1.3.

19. The correct answer is d) because the original equations should be either solved individually (plugging the result into the second equation), or one equation should be multiplied by a value (both sides!) so that when the two equations are added, one variable cancels.
To use the first method, solve x+y = 9 for x. "x" was chosen arbitrarily. "y" could just as easily have been selected. This means x = 9-y. Now substitute "9-y" for the x value of the second equation: 3x-2y = 7. When the substitution is made, the second equation becomes $3(9-y)-2y=7$. Perform the multiplication: 27-3y-2y = 7. Combine terms: 27-5y = 7. Subtract 27 from both sides: -5y = -20. Then divide both sides by -5: y = 4. Once the value is obtained, substitute it back into the first equation. x+4 = 9. Subtract 4 from both sides to find that x = 5.
To use the second method, multiply both sides of the first equation by -3. This gives -3x-3y = -27. The -3 was selected as a multiplier so that the -3x of the first equation will sum to zero with the positive 3x in the second equation when both equations are added. Adding the equations, -3x-3y+3x-2y = 7-27. Combining terms: -5y = -20. Divide both sides by -5 to arrive at y = 4. Once a y value is obtained, plug it into either equation to solve for the x value.

20. The correct answer is b) because $x^2 + y = 16$ and $\frac{3x^2}{2y} = 3$ were the original equations. In this case, I choose (although there are other ways to proceed) to first multiply both sides of the second equation by $2y$. This gives $6y = 3x^2$. Divide both sides of the equation by 3. This gives $x^2 = 2y$. Multiply both sides of this equation by -1 (this allows the x^2 values to sum to zero when the two equations are added). The equation now reads: $-x^2 = -2y$. Add this equation to the first equation: $x^2 + y - x^2 = 16 - 2y$ Combine terms and simplify: $y = 16 - 2y$ Next, add 2y to both sides: $3y = 16$. And divide both sides by 3: $y = 5.333$ Once this value is obtained for y, insert the y value into either equation to solve for x: $x^2 + 5.333 = 16$ Next, subtract five and one third from both sides: $x^2 = 10.667$, and finally, take the square root of both sides: $\sqrt{x^2} = \sqrt{10.667}$ or $x = \pm 3.266$