

**CHAPTER 1, FORM A
COLLEGE ALGEBRA**

NAME _____
DATE _____

Solve each equation.

1. $5 + 4(x - 1) = 2x + 2(x + 4)$ 1. _____

2. $\frac{2x - 9}{4} = 2 + \frac{x}{12}$ 2. _____

3. $48x^2 + 12x = 90$ 3. _____

4. $3x^2 = 2(x - 1)$ 4. _____

5. $\frac{3x}{x - 2} + \frac{1}{x + 2} = \frac{-4}{x^2 - 4}$ 5. _____

6. $\sqrt{x + 3} + \sqrt{2 - x} = 3$ 6. _____

7. $\sqrt{x - 1} + x = 3$ 7. _____

8. $x^4 - 13x^2 + 36 = 0$ 8. _____

9. $(x - 5)^{2/3} + 3(x - 5)^{1/3} - 4 = 0$ 9. _____

10. $|x - 1| + 8 = 8$ 10. _____

11. $|x - 3| = |2x + 3|$ 11. _____

12. The formula for the surface area of an open topped rectangular box is $S = LW + 2LH + 2WH$ where S, H, W and L represent surface area, height, width, and length, respectively. Solve this formula for W . 12. _____

Perform each operation. Give the answer in standard form.

13. $(1 - 3i)(2 + 5i)$ 13. _____

14. $(8 + 2i) + (1 - 6i) - (3i - 2)$ 14. _____

15. $\frac{2 + i}{7 - 5i}$ 15. _____

CHAPTER 1, FORM A

16. Simplify the following power of i : i^{73}

16. _____

Solve each inequality. Give the answer using interval notation.

17. $x^2 + 4 > 5x$

17. _____

18. $0 \leq 4 - \frac{1}{3}x < 2$

18. _____

19. $\frac{x}{7} - 3 > \frac{x-4}{3} + 1$

19. _____

20. $|2x - 1| \geq 3$

20. _____

21. $|4 - 2x| > 6$

21. _____

Solve each problem.

22. Bob Grey invests \$22,000, some at 2% and some at 4% annual interest. If he receives an annual return of \$670, how much is invested at each rate?

22. _____

23. Jack can paint his apartment in 12 hr. His wife Cheryl requires 20 hr to do the same job. How long would it take them to complete the job if they worked together?

23. _____

24. A baseball is thrown straight upward with an initial speed of 64 ft/sec. The number of feet s above the ground after t seconds is given by the equation $x = -16t^2 + 64t$. At what times will the baseball be 48 ft above the ground?

24. _____

25. The number y of students attending Nequa Valley High School between 1988 and 1996 can be approximated by the model $y = 45.28x^2 - 37.6x + 585$, where $x = 0$ corresponds to 1988. Based on this model, in what year did the school have about 1550 students?

25. _____

**CHAPTER 1, FORM B
COLLEGE ALGEBRA**

NAME _____

DATE _____

Solve each equation.

1. $\frac{3}{5}x - 2 = 2 + \frac{3}{2}x$

1. _____

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

2. _____

3. $\frac{2}{7}(x - 4) - x = -4 - \frac{3}{5}x$

3. _____

4. $(x - 3)^2 = -4$

4. _____

5. $\frac{2}{x+5} - \frac{3}{2x+1} = \frac{5}{6x+3}$

5. _____

6. $x^4 - 3x^2 = 4$

6. _____

7. $\sqrt[3]{x-1} = \sqrt[3]{x^2+2x-21}$

7. _____

8. $\sqrt{x+4} + \sqrt{2x} = 2$

8. _____

9. $|x - 2| = |3x + 8|$

9. _____

10. $|3x - 4| = x$

10. _____

11. $(x - 2)^{2/3} + 2(x - 2)^{1/3} - 8 = 0$

11. _____

12. $\left(\frac{x}{x-2}\right)^2 - \frac{2x}{x-2} - 15 = 0$

12. _____

Perform each operation. Give the answer in standard form.

13. $-(7 - 3i) + (4 + i) - (-1 + i)$

13. _____

14. $(4 + 2i)(-5 + 4i)$

14. _____

CHAPTER 1, FORM B

15. $\frac{4-5i}{2+3i}$ 15. _____

16. Simplify the following power of i : i^{94} 16. _____

Solve each inequality. Give the answer using interval notation.

17. $6x^2 - 5x \leq -1$ 17. _____

18. $7 + \frac{x}{2} < \frac{x}{3} - x$ 18. _____

19. $\frac{-3}{2-x} < 0$ 19. _____

20. $|2x+5| < 4$ 20. _____

21. $|2x-1| < 3$ 21. _____

Solve each problem.

22. What weight of an alloy containing 10% silver must be melted with an alloy containing 60% silver to obtain 10 lb of an alloy containing 40% silver? 22. _____

23. The cost of installing insulation in a particular two bedroom home is \$2400. Present monthly heating costs average \$200, but the insulation is expected to reduce heating costs by 10%. How many months will it take to recover the cost of the insulation? 23. _____

24. The population y of Stevensville between 1986 and 1995 can be approximated by the model $y = 326.5x^2 - 780.3x + 5670$, where $x = 0$ corresponds to 1986. Based on this model, in what year was the population about 6250? 24. _____

25. A ball is thrown upward from ground level with an initial velocity of 108 ft per sec. Its height h in feet after t seconds is given by the equation $h = -16t^2 + 108t$. At what times will the ball be 180 ft above the ground? 25. _____

**CHAPTER 1, FORM C
COLLEGE ALGEBRA**

NAME _____

DATE _____

Solve each equation.

1. $4x - 3 = -5x + 6$

1. _____

2. $\frac{2}{5} + \frac{4}{10x+5} = \frac{7}{2x+1}$

2. _____

3. $(4x - 1)^2 + 9 = 0$

3. _____

4. $(x + 2)^2 - 48 = 1$

4. _____

5. $\frac{4x+1}{4} - \frac{x-4}{6} = \frac{2x}{5} - 2$

5. _____

6. $\sqrt{2x+3} - 2 = x$

6. _____

7. $\sqrt[3]{x^2-1} = 2$

7. _____

8. $6x^4 - 7x^2 = -2$

8. _____

9. $3(2z-1)^2 - 11(2z-1) + 10 = 0$

9. _____

10. $|x+4| = 3x-8$

10. _____

11. $|7x+3| = 11$

11. _____

12. Solve the following equation for x : $ax + 2by = 2az - 5bx$

12. _____

Perform each operation. Give the answer in standard form.

13. $(-4 + 2i) - (16 + 8i) + (13 - 2i)$

13. _____

14. $(3 + 5i)(2 - 7i)$

14. _____

15. $\frac{4-2i}{-5i}$

15. _____

16. Simplify the following power of i : i^{68}

16. _____

CHAPTER 1, FORM C

Solve each inequality. Give the answer using interval notation.

17. $x^2 - 5x + 4 > 0$ 17. _____

18. $\frac{3(4-5x)}{2} + 5x > 1$ 18. _____

19. $\frac{x}{2x+1} < -4$ 19. _____

20. $|7 - 3x| \leq 2$ 20. _____

21. $\left| \frac{2x+5}{3} \right| < 1$ 21. _____

Solve each problem.

22. How many pounds of extra-lean hamburger that is 7% fat must be mixed with 30 pounds of hamburger that is 15% fat to obtain a mixture that is 10% fat? 22. _____

23. A workman's basic hourly wage is \$24, but he receives one and a half times his hourly rate for any hours worked in excess of 40 hours per week. If his paycheck for the week is \$1392, how many hours of overtime did he work? 23. _____

24. A ball is thrown upward from ground level with an initial velocity of 108 ft per sec. Its height h in feet after t seconds is given by the equation $h = -16t^2 + 108t$. At what time will the ball hit the ground? 24. _____

25. The number y of visitors to Dragon Lake State park between 1984 and 1992 can be approximated by the model $y = 172.35x^2 - 303.4x + 6972$, where $x = 0$ corresponds to 1984. Based on this model, in what year did the park have about 8500 visitors? 25. _____

**CHAPTER 1, FORM D
COLLEGE ALGEBRA**

NAME _____

DATE _____

Solve each equation.

1. $\frac{5}{6}(x+8) - \frac{2}{3}(x+6) = 2x+10$

1. _____

2. $(x-2)(x-3) = (x+3)(x+4)$

2. _____

3. $(5x-3)^2 = -49$

3. _____

4. $5x\left(x + \frac{1}{5}\right) = 3$

4. _____

5. $\frac{7}{x-2} - \frac{6}{x^2-4} = \frac{3}{2x+4}$

5. _____

6. $\sqrt{7x+2} = 6-x$

6. _____

7. $\sqrt[3]{x^3-7} + 1 = x$

7. _____

8. $x^4 = 256$

8. _____

9. $(x^2-4x)^2 - 36 = 9(x^2-4x)$

9. _____

10. $|7x-5| = -12$

10. _____

11. $|2x-3| = |3x-5|$

11. _____

12. Solve the following equation for C: $P + N = \frac{C+2}{C}$

12. _____

Perform each operation. Give the answer in standard form.

13. $(3+4i)(2+7i)$

13. _____

14. $(5+3i) + (2-4i) - (3-8i)$

14. _____

15. $\frac{2-\sqrt{-16}}{3+\sqrt{-1}}$

15. _____

CHAPTER 1, FORM D

16. Simplify the following power of i : i^{-55} 16. _____

Solve each inequality. Give the answer using interval notation.

17. $x^2 - 5x < -6$ 17. _____

18. $3(x - 2) \leq 2(x + 5)$ 18. _____

19. $\frac{4}{x+1} < 1$ 19. _____

20. $1 < |x - 2| < 4$ 20. _____

21. $|3x - 9| < 10$ 21. _____

Solve each problem.

22. How many gallons of a cream that is 22% butterfat must be mixed with milk that is 2% butterfat to get 20 gallons of milk containing 4% butterfat? 22. _____

23. Jay invested \$28,500 in two accounts, one paying 2.5% simple interest, and the other paying 3.5%. She received \$877.50 in interest for 1 yr. How much did she invest each time? 23. _____

24. An arrow is shot upward from a platform 40 ft high with an initial velocity of 224 ft per sec. Its height h in feet after t seconds is given by the equation $h = -16t^2 + 224t + 40$. At what times will the arrow be 424 ft above the ground? 24. _____

25. The number y of students enrolled in Fox Grove Community College between 1983 and 1990 can be approximated by the model $y = 36.28x^2 - 98.61x + 8605$, where $x = 0$ corresponds to 1983. Based on this model, in what year did the college have about 8800 students? 25. _____

**CHAPTER 1, FORM E
COLLEGE ALGEBRA**

NAME _____
DATE _____

Choose the best answer.

Solve each equation.

1. $2(x-1)+1=3(x-4)+5(1-2x)+6(1+x)$

- a. \emptyset b. $\{0\}$ c. $\{1\}$ d. $\{2\}$

1. _____

2. $-3x-2+6(x+1)=-5x-3$

- a. $\left\{\frac{7}{3}\right\}$ b. $\left\{-\frac{11}{8}\right\}$ c. $\left\{-\frac{7}{8}\right\}$ d. $\left\{\frac{11}{3}\right\}$

2. _____

3. $5x\left(x+\frac{1}{5}\right)=3$

- a. $\left\{\frac{-4\pm\sqrt{10}}{12}\right\}$ b. $\left\{\frac{-4\pm\sqrt{10}}{6}\right\}$
c. $\left\{\frac{-4\pm\sqrt{22}}{6}\right\}$ d. $\left\{\frac{-8\pm\sqrt{10}}{6}\right\}$

3. _____

4. $x^2+4x-5=0$

- a. $\{-\sqrt{5}, \sqrt{5}\}$ b. $\{-5, 1\}$
c. $\{-1, 5\}$ d. $\{-5, 0\}$

4. _____

5. $\frac{9x}{4}-x=\frac{x}{8}-\frac{7}{2}$

- a. $\left\{\frac{28}{11}\right\}$ b. $\left\{\frac{28}{9}\right\}$ c. $\left\{-\frac{28}{11}\right\}$ d. $\left\{-\frac{28}{9}\right\}$

5. _____

6. $\sqrt[3]{x^2-3x}=\sqrt[3]{3x^2-2}$

- a. $\{-2\}$ b. $\{3\}$ c. $\left\{-2, \frac{1}{2}\right\}$ d. \emptyset

6. _____

7. $\sqrt{14x-7}=x+3$

- a. $\{2\}$ b. $\{-4\}$ c. $\{4\}$ d. $\{-3\}$

7. _____

CHAPTER 1, FORM E

8. $x^4 + 3 = 4x^2$

a. $\{\pm\sqrt{3}, \pm i\}$

b. $\{\pm 1, \pm i\sqrt{3}\}$

c. $\{\pm 1, \pm\sqrt{3}\}$

d. $\{\pm 1, \pm 3\}$

8. _____

9. $x^{2/3} - x^{1/3} - 6 = 0$

a. $\{-8, 27\}$

b. $\{8, -27\}$

c. $\{8, 27\}$

d. $\{-8, -27\}$

9. _____

10. $-3|x-3|=18$

a. $\{-3, 9\}$

b. $\{3\}$

c. $\{-9, 3\}$

d. \emptyset

10. _____

11. $|3-x|=|1-2x|$

a. \emptyset

b. $\{-2\}$

c. $\left\{3, \frac{1}{2}\right\}$

d. $\left\{-2, \frac{4}{3}\right\}$

11. _____

12. Solve the following equation for x : $4ax - 2by = 2cx + 5$

a. $x = \frac{2c+5}{4a-2by}$

b. $x = \frac{2by+5}{4a-2c}$

c. $x = \frac{4a-2c}{2by+5}$

d. $x = \frac{2c+5}{4a-2by}$

12. _____

Perform each operation. Give the answer in standard form.

13. $(-4+2i)+(6+8i)-(13-2i)$

a. $-11+8i$

b. $-11+12i$

c. $-15+8i$

d. $-15+12i$

13. _____

14. $(8-5i)(9+8i)$

a. $-40i^2+19i-72$

b. $112+19i$

c. $112-19i$

d. $32-109i$

14. _____

15. $\frac{6-3i}{5+8i}$

a. $\frac{54}{89} - \frac{33}{89}i$

b. $-\frac{18}{13} - \frac{21}{13}i$

c. $\frac{6}{89} - \frac{63}{89}i$

d. $-\frac{2}{13} - \frac{21}{13}i$

15. _____

CHAPTER 1, FORM E

16. Simplify the following power of i : i^{37} 16. _____
a. i b. -1 c. $-i$ d. 1

Solve each inequality. Give the answer using interval notation.

17. $2(x+2) \leq \frac{3}{4}x - 1$ 17. _____
a. $(-\bullet, -4]$ b. $(-4, \bullet)$ c. $[-4, \bullet)$ d. $(-\bullet, 4]$

18. $14 \leq 3x + 5 \leq 23$ 18. _____
a. $[-6, -3]$ b. $(-6, -3)$
c. $(3, 6)$ d. $[3, 6]$

19. $\left| \frac{2x-1}{3} < \frac{5}{3} \right|$ 19. _____
a. $(-2, 3)$ b. $(-3, -2)$ c. $(-3, 2)$ d. $[-2, 3]$

20. $\frac{x}{x-2} \geq 5$ 20. _____
a. $\left[2, \frac{5}{2} \right)$ b. $\left[2, \frac{5}{2} \right]$ c. $\left(2, \frac{5}{2} \right]$ d. $\left(2, \frac{5}{2} \right)$

21. $|5x - 3| \geq 7$ 21. _____
a. $\left[-\frac{4}{5}, 2 \right]$ b. $(2, \infty)$
c. $\left(-\infty, -\frac{4}{5} \right) \cup [2, \infty)$ d. $(-\infty, -2) \cup [7, \infty)$

Solve each problem.

22. A 60% alcohol solution is to be mixed with a 42% alcohol solution. 22. _____
How many liters of the 60% solution should be used to make 30 liters of a 54% alcohol solution?
a. 15 b. 18 c. 20 d. 10
23. Two cars leave at the same point at the same time traveling in opposite 23. _____
directions. One travels 8 mph slower than the other. After 4 hr, they
are 368 mi apart. Find the speed of the faster car.
a. 42 mph b. 50 mph c. 60 mph d. 68 mph

CHAPTER 1, FORM E

24. The number y of people attending the Ozark Mountain Bluegrass Festival between 1989 and 1996 can be approximated by the model $y = 69.75x^2 - 328.7x + 1283$, where $x = 0$ corresponds to 1989. Based on this model, in what year was the festival attendance about 1800?
- a. 1999 b. 1991 c. 1995 d. 1993
24. _____
25. The height in feet of an object thrown upward is given by the equation $h = 80t - 16t^2$, where h is the height of the object after t seconds. After how many seconds will the object reach a height of 100 feet?
- a. $1\frac{1}{2}$ sec b. 2 sec c. $2\frac{1}{2}$ sec d. sec
25. _____

**CHAPTER 1, FORM F
COLLEGE ALGEBRA**

NAME _____
DATE _____

Choose the best answer.

Solve each equation.

1. $2(2x+3)+2(5x+4)=5+7(2x-1)$

- a. \emptyset b. $\left\{-\frac{3}{4}\right\}$ c. $\left\{-\frac{3}{2}\right\}$ d. $\left\{\frac{5}{4}\right\}$

1. _____

2. $\frac{2}{3}(2x+7)-\frac{3}{2}=\frac{1}{2}x-\frac{3}{4}x$

- a. $\{-2\}$ b. $\{1\}$ c. $\left\{\frac{5}{4}\right\}$ d. $\{0\}$

2. _____

3. $3x(x-4)=2x-9$

- a. $\left\{\frac{5\pm 2\sqrt{2}}{3}\right\}$ b. $\left\{\frac{5}{3}\pm\frac{2}{3}i\sqrt{2}\right\}$
c. $\left\{\frac{7\pm\sqrt{22}}{3}\right\}$ d. $\left\{\frac{7}{3}\pm\frac{1}{3}i\sqrt{22}\right\}$

3. _____

4. $\frac{2}{x^2-36}-\frac{1}{x-6}=\frac{1}{x+6}$

- a. $\{-1\}$ b. $\left\{-\frac{12}{5}\right\}$ c. $\{1\}$ d. $\left\{\frac{3}{2}\right\}$

4. _____

5. $15x^2=8x$

- a. $\{0\}$ b. $\left\{-\frac{8}{15}, \frac{8}{15}\right\}$
c. $\left\{0, \frac{8}{15}\right\}$ d. $\left\{-\frac{8}{15}, 0\right\}$

5. _____

6. $x-\sqrt{3x-2}=4$

- a. $\{2, 9\}$ b. $\{9\}$ c. $\{-1\}$ d. $\{1, 2\}$

6. _____

7. $\sqrt[3]{4x^2+3}=\sqrt[3]{x^2+10x}$

- a. $\{0, -10\}$ b. $\left\{-\frac{1}{3}, -3\right\}$ c. $\left\{\pm\frac{1}{2}i\sqrt{3}\right\}$ d. $\left\{\frac{1}{3}, 3\right\}$

7. _____

CHAPTER 1, FORM F

8. $x^4 + 4 = 5x^2$

a. $\{\pm 1, \pm 2\}$

b. $\{\pm 1, \pm\sqrt{2}\}$

c. $\{\pm i, \pm 2i\}$

d. $\{\pm 1, \pm 2i\}$

8. _____

9. $(3x-1)^2 + (3x-1) = 72$

a. $\{9, -8\}$

b. $\{-9, 8\}$

c. $\left\{-\frac{7}{3}, \frac{10}{3}\right\}$

d. $\left\{-\frac{8}{3}, 3\right\}$

9. _____

10. $|3x+9| = 0$

a. $\{-3, 3\}$

b. \emptyset

c. $\{-3\}$

d. $\{3\}$

10. _____

11. $|3x+1| - 4 = -7$

a. $\left\{-\frac{4}{3}\right\}$

b. $\left\{\frac{2}{3}, \frac{4}{3}\right\}$

c. $\left\{-\frac{4}{3}, -\frac{2}{3}\right\}$

d. \emptyset

11. _____

12. Solve the following equation for x : $4ax - 3by + 4 = 2cx + dz$

a. $x = \frac{2c + dz}{4a - 3by + 4}$

b. $x = \frac{4a - 2c}{3by + dz - 4}$

c. $x = \frac{4a - 3by + 4}{2c + dz}$

d. $x = \frac{3by + dz - 4}{4a - 2c}$

12. _____

Perform each operation. Give the answer in standard form.

13. $(5+3i) - (2-4i) - (3-8i)$

a. $9i$

b. $6+7i$

c. $15i$

d. $6+15i$

13. _____

14. $(\sqrt{10} + 2i)(\sqrt{10} - 2i)$

a. $10 - 4i$

b. $10 + 4i$

c. 14

d. 8

14. _____

15. $\frac{6+2i}{4+7i}$

a. $-\frac{10}{33} + \frac{34}{33}i$

b. $-\frac{38}{33} + \frac{34}{33}i$

c. $\frac{38}{65} - \frac{34}{65}i$

d. $\frac{2}{13} - \frac{10}{13}i$

15. _____

CHAPTER 1, FORM F

16. Simplify the following power of i : i^{65} 16. _____
 a. i b. -1 c. $-i$ d. 1

Solve each inequality. Give the answer using interval notation.

17. $\frac{9x+8}{8} < \frac{64}{9}$ 17. _____
 a. $\left(\frac{440}{81}, \infty\right)$ b. $\left(\frac{64}{9}, \infty\right)$ c. $\left(-\infty, \frac{440}{81}\right)$ d. $\left(-\infty, \frac{64}{9}\right)$

18. $\frac{3x+4}{2x-1} \leq 0$ 18. _____
 a. $\left(-\infty, -\frac{4}{3}\right) \cup \left(\frac{1}{2}, \infty\right)$ b. $\left[-\frac{4}{3}, \frac{1}{2}\right)$
 c. $\left(-\frac{4}{3}, \frac{1}{2}\right)$ d. $\left[-\frac{4}{3}, \frac{1}{2}\right]$

19. $4x^2 < 20 + 11x$ 19. _____
 a. $\left(-\infty, -\frac{5}{4}\right) \cup (4, \infty)$ b. $\left(-\frac{5}{4}, 4\right)$
 c. $\left(-4, \frac{5}{4}\right)$ d. $(-\infty, -4) \cup \left(\frac{5}{4}, \infty\right)$

20. $|x+6|-9 > 12$ 20. _____
 a. $(-\infty, -23) \cup (-7, \infty)$ b. $(-\infty, -27) \cup (15, \infty)$
 c. $(-\infty, -7) \cup (23, \infty)$ d. $(-23, 11)$

21. $|3-2x| \leq 19$ 21. _____
 a. $[-8, 11]$ b. $(-8, 11)$ c. $(-\infty, -8)$ d. $(11, \infty)$

Solve each problem.

22. Two runners, Alma and Kim, leave home at the same time and jog in different directions. Alma travels east at a uniform rate that is 2 mph faster than Kim, who is traveling west. After 2 hr, they are 28 mi apart. Find Alma's rate. 22. _____
 a. 4 mph b. 6 mph c. 8 mph d. 10 mph

CHAPTER 1, FORM F

23. Mona can process 100 requests in 4 hr, and Jane can process 100 requests in twice the time. How long will it take both Mona and Jane, working together, to process 200 requests? **23.** _____
- a. $2\frac{2}{3}$ hr b. 6 hr c. $3\frac{2}{3}$ hr d. $5\frac{1}{3}$ hr
24. The number y of fish in Silver Lake between 2000 and 2015 can be approximated by the model $f(x) = 1000(30 + 17x - x^2)$ where x corresponds to the year 2000. Based on this model, in what year was the fish population about 100,000? **24.** _____
- a. 2005 b. 2007 c. 2010 d. 2012
25. The height in feet of an object thrown upward is given by the equation where h is the height of the object after t seconds. After how many seconds will the object reach a height of 36 feet? **25.** _____
- a. $1\frac{1}{2}$ sec b. $2\frac{1}{2}$ sec c. 2 sec d. 5 sec