Test Bank Exercises in

CHAPTER 2

Exercise Set 2.1

1. Solve for x the equation $3(2x - 1) - 2(x + 4) = 6$.

   (a) $x = \frac{17}{4}$ (b) $x = 6$ (c) $x = \frac{11}{12}$ (d) None of the above.

2. Solve for x the equation $2(1 - 2x) - 4(x + 3) = 5(1 - x)$.

   (a) $x = \frac{23}{40}$ (b) $x = \frac{5}{6}$ (c) $x = -5$ (d) None of the above.

3. Solve for x the equation $\frac{x + 5}{7x + 6} = \frac{3}{8}$.

   (a) $x = \frac{1}{4}$ (b) $x = \frac{22}{13}$ (c) $x = \frac{9}{2}$ (d) None of the above.

4. Solve for x the equation $\frac{3x - 5}{1 - 2x} = \frac{2}{3}$.

   (a) $x = \frac{11}{12}$ (b) $x = \frac{5}{13}$ (c) $x = \frac{17}{13}$ (d) None of the above.

5. Solve for x the equation $\frac{3}{x - 1} + 5 = \frac{7}{x - 1}$.

   (a) $x = \frac{21}{11}$ (b) $x = \frac{9}{5}$ (c) $x = \frac{5}{9}$ (d) None of the above.

6. Solve for x the equation $\frac{5}{1 - 2x} - 4 = \frac{9}{1 - 2x}$.

   (a) $x = \frac{15}{13}$ (b) $x = 0$ (c) $x = 1$ (d) None of the above.

7. Solve for the x the equation $\frac{x+2}{3x-7} = \frac{x+8}{3x}$.

(a) $x = \frac{17}{44}$ (b) $x = -\frac{56}{11}$ (c) $x = \frac{56}{11}$ (d) None of the above.

8. Solve for x the equation $\frac{2x-5}{3x+7} = \frac{2x+3}{3x}$.

(a) $x = \frac{11}{4}$ (b) $x = 1.87$ (c) $x = -\frac{21}{38}$ (d) None of the above.

9. Solve for x the equation $\frac{x+1}{3} - \frac{x-1}{5} = \frac{2x-3}{2}$.

(a) $x = \frac{1}{4}$ (b) $x = \frac{61}{26}$ (c) $x = \frac{25}{59}$ (d) None of the above.

10. Solve for x the equation $\frac{2x-7}{5} + \frac{x-4}{4} = \frac{1-2x}{3}$.

(a) $x = \frac{23}{40}$ (b) $x = -\frac{164}{79}$ (c) $x = \frac{164}{79}$ (d) None of the above.

11. Solve for x the equation $\frac{3}{x-2} + \frac{4}{x+2} = \frac{1}{x^2-4}$.

(a) $x = \frac{32}{45}$ (b) $x = 5$ (c) $x = \frac{3}{7}$ (d) None of the above.

12. Solve for x the equation $\frac{5}{2x-1} - \frac{6}{2x+1} = \frac{3}{4x^2-1}$.

(a) $x = \frac{9}{4}$ (b) $x = 4$ (c) $x = \frac{1}{4}$ (d) None of the above.

13. Solve for x the equation $\frac{2x}{x-3} - 2 = \frac{3}{x+3}$.

(a) $x = \frac{11}{12}$ (b) $x = \frac{5}{4}$ (c) $x = -9$ (d) None of the above.

14. Solve for x the equation $\frac{2x}{2x-1} - 1 = \frac{3}{2x+1}$.

(a) $x = \frac{7}{8}$ (b) $x = -\frac{7}{11}$ (c) $x = 1$ (d) None of the above.

15. Solve for x the equation $\frac{2}{x^2-3x} + \frac{x-2}{(x-1)(x-3)} = \frac{1}{x-1}$.

(a) $x = \frac{7}{4}$ (b) $x = \frac{2}{3}$ (c) $x = \frac{5}{2}$ (d) None of the above.

16. Solve for x the equation $\dfrac{3}{x^2+2x}+\dfrac{x-4}{x^2+3x+2}=\dfrac{1}{x+1}$.

(a) $x=\dfrac{8}{5}$ (b) $x=5$ (c) $x=1$ (d) None of the above.

17. Sole for x the equation $\dfrac{2x-1}{x+4}=\dfrac{2x+1}{x-3}$.

(a) $x=\dfrac{3}{8}$ (b) $x=-\dfrac{1}{16}$ (c) $x=\dfrac{1}{16}$ (d) None of the above.

18. Solve for x the equation $\dfrac{3x+2}{x-5}=\dfrac{6x+1}{2x-1}$.

(a) $x=\dfrac{9}{5}$ (b) $x=\dfrac{1}{10}$ (c) $x=-\dfrac{1}{10}$ (d) None of the above.

19. Solve for x the equation $\dfrac{3}{2x-3}+\dfrac{5}{3x+1}=\dfrac{15}{6x^2-7x-3}$.

(a) $x=\dfrac{1}{4}$ (b) $x=3$ (c) $x=\dfrac{27}{19}$ (d) None of the above.

20. Solve for x the equation $\dfrac{4}{x+2}-\dfrac{3}{x-1}=\dfrac{12}{x^2+x-2}$.

(a) $x=\dfrac{7}{3}$ (b) $x=5$ (c) $x=22$ (d) None of the above.

Exercise Set 2.2

1. Sam is 5 years older than his brother. Thirty years from now the sum of their ages will be 75. Find the current ages of the brother.

2. Bob is presently 6 years older than his sister Kathy. Three years ago, Bob was twice as old as Kathy. How old is each now?

3. The larger of the two numbers is 2 less than three times the smaller. If their sum is 16, find the numbers.

4. The larger of the two numbers is 5 less than four times the smaller. If their sum is 30, find the numbers.

5. A 15-foot-long beam is cut into two pieces so that one piece is 7 feet longer than the other. How long will each piece be?

6. An 18-foot-long beam is cut into two pieces so that one piece is twice as long as the other. How long will each piece be?

7. A rectangular field is to be enclosed with a fence 200 fet long. The length of the field is twice its width. Find the length and the width of the field.

8. A rectangular field is to enclosed with a fence 180 feet long. The length of the field is 10 feet more than the width. Find the length and the width of the field.

9. For a certain show, a movie theater charged $3.50 admission for an adult and $1.50 for a child. If 128 tickets were sold and the total revenue received was $348, how many tickets of each type were sold?

10. For a certain show, a movie theater charged $2.50 admission for an adult and $1.00 for a child. If 328 tickets were sold and the total revenue received was $670, how many tickets of each type were sold?

11. A wending machine contains $20.50 in dimes and quarters. If the number of quarters is 5 more than dimes, how many coins of each type are there?

12. A wending machine contains $11.50 in nickels and quarters. If the number of quarters is 20 less than the number of nickels, how many coins of each type are there?

13. A person invests $15,000 in two accounts paying 9.5% and 6.5% per year, respectively. After one year, the part invested at 6.5% earned $15 more than the part invested at 9.5%. How much money was invested into each type of account?

14. A person invests $13,000 into two accounts paying 10.5% and 7% per year, respectively. After one year, the part invested at 10.5% earned $490 more than the part invested at 7%. How much money was invested into each type of account?

Exercise Set 2.3

1. The roots of the equation $2x^2 + 4x - 1$ are
   (a) Equal (b) Real and unequal (c) Rational and unequal (d) Complex

2. The roots of the equation $x^2 + 5x + 7$ are
   (a) Equal (b) Real and unequal (c) Rational and unequal (d) Complex

3. The roots of the equation $4(x + 1)^2 - 9$ are
   (a) Equal (b) Real and unequal (c) Rational and unequal (d) Complex

4. The roots of the equation $x^2 + 6x + 9$ are
   (a) Equal (b) Real and unequal (c) Rational and unequal (d) Complex

5. The roots of the equation $6x^2 + x - 2$ are
   (a) Equal (b) Real and unequal (c) Rational and unequal (d) Complex

6. Solve for x the equation $3x^2 - 6x + 4 = 0$.

   (a) $x = \pm i$ (b) $x = \frac{1}{3}$ or $x = 2$ (c) $x = 1 \pm \frac{\sqrt{3}}{3}i$ (d) None of the above.

7. Solve for x the equation $x + \frac{2}{x} = 2$.

   (a) $x = 2 \pm i$ (b) $x = 1 \pm i$ (c) $2i$ (d) None of the above.

8. Solve for x the equation $4x^2 + 9x - 17 = 0$.

   (a) $x = \frac{-9 \pm \sqrt{353}}{8}$ (b) $x = -\frac{17}{2}$ or $x = \frac{1}{2}$

   (c) $x = 17$ or $x = -\frac{1}{4}$ (d) None of the above.

9. Solve for x the equation $\sqrt{x - 4} = 3x - 22$.

10. Solve for x the equation $\sqrt{3x - 4} + 2 = x + \frac{4}{3}$.

11. Solve for x the equation $6x^2 - 7x + 2 = 0$.

    (a) $x = \frac{2}{3}$ or $x = \frac{1}{2}$ (b) $x = -\frac{2}{3}$ or $x = -\frac{1}{2}$

    (c) $x = -3$ or $x = 4$ (d) None of the above.

12. Solve for x the equation $\sqrt{x + 1} + \sqrt{x - 1} = 4$.

    (a) $x = 9$ (b) $x = \frac{237}{95}$ (c) $x = \frac{65}{16}$ (d) None of the above.

13. Solve for x the equation $\sqrt{3x + 3} + \sqrt{2x - 3} = 4$.

14. Solve for x the equation $x^{\frac{2}{3}} + 3x^{\frac{1}{3}} + 2 = 0$.

    (a) $x = 27$ or $x = -1$ (b) $x = -8$ or $x = -1$

    (c) $x = 8$ or $x = 1$ (d) None of the above.

15. Solve for x the equation $x - 5\sqrt{5} + 4 = 0$.

    (a) $x = 1$ or $x = 16$ (b) $x = 2$ or $x = 8$

    (c) $x = 6$ or $x = -1$ (d) None of the above.

16. Solve for x the equation $x^4 - 5x^2 + 4 = 0$.

    (a) $x = \pm 1$ or $x = \pm 2$ (b) $x = \pm\sqrt{2}$ or $x = \pm\sqrt{3}$

    (c) $x = \pm 1$ or $x = \pm 2x$ (d) None of the above.

17. Solve for x the equation $x^4 - 5x^2 + 6 = 0$.
    (a) $x = 2$ or $x = 3$ (b) $x = \pm\sqrt{2}$ or $x = \pm\sqrt{3}$
    (c) $x = -2$ or $x = -3$ (d) None of the above.

18. Solve for x the equation $x - \sqrt{x} - 6 = 0$.
    (a) $x = 9$ or $x = 4$ (b) $x = -9$ or $x = 4$
    (c) $x = 2$ or $x = 3$ (d) None of the above.

19. Solve for x the equation $x^{\frac{2}{3}} + x^{\frac{1}{3}} - 6 = 0$.
    (a) $x = 2$ or $x = -3$ (b) $x = -8$ or $x = 27$
    (c) $x = 8$ or $x = -27$ (d) None of the above.

20. Solve for x the equation $x^6 + x^3 - 2 = 0$.
    (a) $x = -2$ or $x = 1$ (b) $x = 2$ or $x = 1$
    (c) $x = -\sqrt[3]{2}$ or x = 1 (d) None of the above.

Exercise Set 2.4

1. The length of a rectangle exceeds its width by 5 feet. If the area of the rectangle is 176 square feet, find its dimensions.

2. The length of a rectangle exceeds its width by 7 feet. If the area of the rectangle is 260 square feet, find its dimensions.

3. The sum of the reciprocals of two consecutive numbers is $\frac{19}{90}$. Find the numbers.

4. The sum of the reciprocals of two consecutive numbers is $\frac{23}{132}$. Find the numbers.

5. The smaller of the two numbers is 3 less than the larger. If the sum of their squares is 177, find the numbers.

6. The smaller of the two numbers is 5 less than the larger. If the sum of their squares is 377, find the numbers.

7. The smaller of the two numbers is 4 less than the larger. If the product of the numbers is 165, find the numbers.

8. A wire 64 cm long is cut into two pieces. Each piece is bent to form a square. Where should the wire be cut so that the sum of the areas of the squares is equal to 136 cm^2.

9. A wire 256 cm long is cut into two pieces. Each piece is bent to form a square. Where should the wire be cut so that the sum of the areas of the squares is equal to 2336 cm^2.

10. What is the length of each edge of a cube if its surface area is 150 in^2?

11. What is the length of each side of a cube if its surface area is 486 in^2?

12. An object is thrown vertically upward from the ground. After t seconds, its height is given by $h(t) = -16t^2 + 96t$. After how many seconds will its height be 144 feet?

13. An object is thrown vertically upward from the top of a tower. After t seconds, its height above the ground is given by $h(t) = -16t^2 + 64t + 52$. After how many seconds will its height be 100 feet above the ground?

14. A manufacturer estimates that the cost (in dollars) of producing x number of items of a certain commodity is given by $C = 0.5x^2 - 16x + 466$. How many units should be produced so that the cost is \$338?

15. A manufacturer estimates that the cost (in dollars) of producing x number of items of a certain commodity is given by $C = 0.2x^2 - 16x + 850 = 530$. How many units should be produced so that the cost is \$530?

Exercise Set 2.5

1. Solve the inequality $x + \geq 2$. Graph the result.
   (a) $x \geq 6$ (b) $x \geq -2$ (c) $x \leq -2$ (d) None of the above.

2. Solve the inequality $3x + 5 < -1$. Graph the result.
   (a) $x > -2$ (b) $x < -\frac{14}{3}$ (c) $x < -2$ (d) None of the above.

3. Solve the inequality $-5 < 2x + 3 < 1$. Graph the result.
   (a) $3 < x < 4$ (b) $-4 < x < -1$ (c) $-\frac{3}{2} < x < -2$ (d) None of the above.

4. Solve the inequality $1 \leq 3x - 4 < 3$. Graph the result.
   (a) $\frac{13}{3} < x < 5$ (b) $\frac{5}{3} \leq x < \frac{7}{3}$ (c) $-5 < x < 0$ (d) None of the above.

5. Solve the inequality $\frac{1}{x + 1} \leq 3$. Graph the result.
   (a) $-\frac{2}{3} \leq x$ (b) $x \leq -\frac{2}{3}$ (c) $x \geq \frac{3}{2}$ (d) None of the above.

6. Solve the inequality $\frac{-2}{1 - x} \geq 5$. Graph the result.
   (a) $1 < x \leq \frac{7}{5}$ (b) $x \geq 6$ (c) $x \leq \frac{7}{5}$ (d) None of the above.

7. Solve the inequality $3(2x - 1) \leq 11$. Graph the result.

   (a) $x \geq \frac{7}{3}$ (b) $x \leq \frac{3}{7}$ (c) $x \leq \frac{7}{3}$ (d) None of the above.

8. Solve the inequality $-2(1 - 4x) \geq -5$. Graph the result.

   (a) $x \leq -\frac{3}{8}$ (b) $x \geq -\frac{3}{8}$ (c) $x \leq \frac{8}{3}$ (d) None of the above.

9. Solve the inequality $3(2x + 4) \geq 5(x - 6)$. Graph the result.

   (a) $x \geq -42$ (b) $x \leq -42$ (c) $x \geq 5$ (d) None of the above.

10. Solve the inequality $4(3x - 2) \leq 3(1 - 2x)$. Graph the result.

    (a) $x \geq \frac{3}{11}$ (b) $x \geq \frac{11}{3}$ (c) $x \leq \frac{11}{18}$ (d) None of the above.

11. Solve the inequality $x^2 + 9x \geq 0$. Graphed the result.

    (a) $x \geq 0$ or $x \leq -9$ (b) $-9 \leq x \leq 0$

    (c) $x \geq -9$ (d) None of the above.

12. Solve the inequality $x^2 - 5x + 4 \leq 0$. Graph the result.

    (a) $x \leq 4$ (b) $1 \leq x \leq 4$ (c) $x \geq 4$ or $x \leq 1$ (d) None of the above.

13. Solve the inequality 6x2 + x – 1 > 0. Graph the result.

    (a) $-\frac{1}{2} \leq x \leq \frac{1}{3}$ (b) $x \leq \frac{1}{3}$

    (c) $x \leq -\frac{1}{2}$ or $x \geq \frac{1}{3}$ (d) None of the above.

14. Solve the inequality $(x - 1)(x + 1)(x - 2) > 0$. Graph the result.

    (a) $x > 2$ or $-1 < x < 1$ (b) $x > 1$ or $x < -1$

    (c) $1 < x < 2$ or $x < -1$ (d) None of the above.

15. Solve the inequality $(2x - 3)(x + 4)(x - 2) \leq 0$. Graph the result.

    (a) $x \leq -2$ (b) $\frac{3}{2} \leq x \leq 2$ or $x \leq 4$

    (c) $x \geq 2$ or $x \leq -4$ (d) None of the above.

16. Solve the inequality $\frac{2x + 1}{x + 4} \geq 0$. Graph the result.

17. Solve the inequality $\frac{3x - 2}{2x + 3} \leq 0$. Graph the result.

18. The expression $\sqrt{(x-2)(x+3)}$ has real values for

(a) $x \leq -3$ or $x \geq 2$ (b) $-3 \leq x \leq 2$

(c) $x < 2$ (d) None of the above.

19. The expression $\sqrt{(1-2x)(x+4)}$ has real values for

(a) $x < -\frac{1}{2}$ (b) $x > -\frac{1}{2}$ or $x -4$

(c) $-4 < x < -\frac{1}{2}$ (d) None of the above.

20. The expression $\sqrt{(2x+1)(x+6)}$ has real values for

(a) $-\frac{1}{2} < x < -6$ (b) $x > -\frac{1}{2}$ or $x < -6$

(c) $x < -\frac{1}{2}$ (d) None of the above.