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

   (a) There is no solution.

   (b) 31

   (c) -33

   (d) -19

2. Suppose that a, b and x are non-zero real numbers, and $\dfrac{1}{x} = \dfrac{1}{a} - \dfrac{1}{b}$. Solve this formula for x.

   (a) $x = \dfrac{a+b}{a-b}$

   (b) $x = \dfrac{ab}{-b-a}$

   (c) $x = \dfrac{ab}{a-b}$

   (d) $x = a\dfrac{b}{b-a}$

3. Find the equation of the straight line that is parallel to $y = -2x + 3$ and passes through the point $(-6, 1)$.

   (a) $y = \dfrac{1}{2}x + 4$

   (b) $y = -\dfrac{1}{2}x - 2$

   (c) $y = 2x + 13$

   (d) $y = -2x - 11$

4. Find the equation of the straight line that is perpendicular to $y = -2x + 3$ and passes through the point $(-6, 1)$.

   (a) $y = \dfrac{1}{2}x + 4$

   (b) $y = -\dfrac{1}{2}x - 2$

   (c) $y = 2x + 13$

   (d) $y = -2x - 11$

5. Simplify the expression $\dfrac{x^2+2x-15}{x^2-8x+15}$

   (a) $-\dfrac{1}{4}$
   (b) $\dfrac{x+3}{x-3}$
   (c) -1
   (d) $\dfrac{x+5}{x-5}$

6. Simplify the expression $\dfrac{x^2-30x-675}{x^2-6x-1755}$

   (a) $\dfrac{5x-675}{x-1755}$
   (b) $\dfrac{x-75}{x+351}$
   (c) $\dfrac{x+15}{x+39}$
   (d) $\dfrac{x+15}{x-5}$

7. Simplify $\dfrac{2ax+6ay-bx-3by}{6ax-2ay-3bx+by}$

   (a) $\dfrac{x+3y}{3x-y}$
   (b) $\dfrac{x-3y}{3x+y}$
   (c) $\dfrac{x+y}{x-y}$
   (d) $\dfrac{x-y}{x+y}$

8. Perform the operation and simplify. $\dfrac{x^2-5x+78}{18x+x^2-208}-\dfrac{x}{x+26}$

   (a) $\dfrac{8}{x+26}$
   (b) $\dfrac{-2x}{x-26}$
   (c) $\dfrac{x}{x-8}$
   (d) $\dfrac{3}{x-8}$

9. Simplify: $\dfrac{2m-1}{m^2-m-2} - \dfrac{1}{m+1}$

   (a) $\dfrac{m-3}{m^2-m-2}$

   (b) $\dfrac{1}{m-2}$

   (c) $\dfrac{2(m-1)}{m^2-2m-1}$

   (d) $\dfrac{-m-3}{2m+2}$

10. Simplify: $\dfrac{\dfrac{3}{x-1}-1}{\dfrac{2}{x-1}+1}$

    (a) $\dfrac{-x+2}{x+1}$

    (b) $\dfrac{3}{2}$

    (c) $\dfrac{2}{3}$

    (d) $\dfrac{-x+4}{x+1}$

11. Simplify $1 - \dfrac{1}{1-\dfrac{1}{1-\dfrac{1}{x-1}}}$

    (a) $\dfrac{x-1}{2x-3}$

    (b) $3-x$

    (c) $x-1$

    (d) $\dfrac{x+1}{2x+1}$

12. Simplify the expression $3\sqrt{20} - 4\sqrt{45} + 2\sqrt{245}$

    (a) $8\sqrt{5}$

    (b) $-2\sqrt{5}$

    (c) $32\sqrt{5}$

    (d) $-20\sqrt{5}$

13. Simplify the expression $\sqrt{12} - 2\sqrt{75} + \sqrt{48}$

    (a) $-4\sqrt{3}$
    (b) $9\sqrt{3} + \sqrt{10}$
    (c) $\sqrt{3}$
    (d) $-3\sqrt{10}$

14. Perform the indicated operations and simplify.

$$\left(3 - 2\sqrt{5}\right)\left(\sqrt{5} - 1\right)$$

    (a) $-8\sqrt{5}$
    (b) $\sqrt{5} + 7$
    (c) $5\sqrt{5} - 13$
    (d) $5\sqrt{5} - 17$

15. Simplify the expression $\left(3\sqrt{5} - 1\right)\left(7\sqrt{5} + 2\right)$

    (a) $107 - 13\sqrt{5}$
    (b) $103 - \sqrt{5}$
    (c) $13\sqrt{5} + 107$
    (d) $-13\sqrt{5} - 107$

16. Let $a = -3 + \sqrt{2}$. Compute the exact value of $a^2 + 6a + 10$.

    (a) $39 - 12\sqrt{2}$
    (b) $5\sqrt{2}$
    (c) 3
    (d) $12\sqrt{2} + 39$

17. Simplify the expression $\left(\sqrt{10} - 3\right)^3$

    (a) $37\sqrt{10} - 117$
    (b) $10\sqrt{10} - 27$
    (c) $19 - 6\sqrt{10}$
    (d) $\sqrt{10} - 3$

18. Rationalize the denominator in the expression $\dfrac{5}{\sqrt{11}-4}$

(a) $-\sqrt{11}-4$

(b) $\dfrac{\sqrt{11}+4}{5}$

(c) $\sqrt{11}-4$

(d) $\dfrac{5\sqrt{11}-4}{5}$

19. Rationalize the denominator in the expression $\dfrac{3}{\sqrt{10}+1}$.

(a) $\dfrac{\sqrt{10}-1}{3}$

(b) $\sqrt{10}+3$

(c) $\dfrac{\sqrt{10}+1}{3}$

(d) $\sqrt{10}-3$

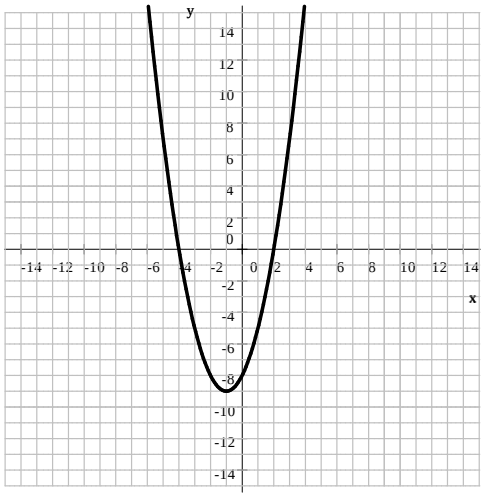
20. Find the equation that belongs to the graph shown on the picture below.

(a) $y = x^2 - 8x + 8$

(b) $y = 2x - x^2 - 8$

(c) $y = 8x + x^2 + 8$

(d) $y = 2x + x^2 - 8$



21. Find the distance between the points $A\,(-5,-12)$ and $B\,(3,3)$.

    (a) 7 in
    (b) 17 in
    (c) $\sqrt{161}$ in
    (d) 13 in

22. Solve the system of equations given below.

$$\begin{aligned} 2x-3y &= 16 \\ x+8y &= -87 \end{aligned}$$

    (a) $(-4,-8)$
    (b) $(23,10)$
    (c) $(-7,-10)$
    (d) The system is dependent.

23. Solve the system of linear equations shown below.

$$\begin{aligned} \frac{1}{2}x-\frac{2}{3}y &= 25 \\ \frac{1}{3}x+\frac{1}{6}y &= 2 \end{aligned}$$

    (a) $(18,-24)$
    (b) $(-18,-51)$
    (c) $(24,-36)$
    (d) $(-6,-42)$

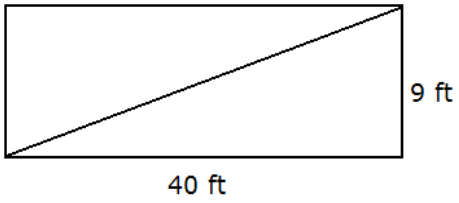
24. The solution set of the equation $x^3 = 24x^2 + 217x$

    (a) $\{-7,0,7\}$
    (b) $\{-31,31\}$
    (c) $\{-7,0,31\}$
    (d) no solution

25. The price of a product was increased by 10% and decreased by 10%. The resulting price is

    (a) less than the original price
    (b) more than the original price
    (c) the same as the original price
    (d) less or more than the original price, depending on whether we first increase and then decrease or vica versa.

26. Find the length of the diagonal of the rectangle shown on the picture below.



(a) $7\sqrt{31}$ ft
(b) 41 ft
(c) 49 ft
(d) $6\sqrt{10}$ ft

27. Find all real solutions of the equation $x^2 = 2x + 1$

(a) $x = 1 - \sqrt{8}, \;\; x = 1 + \sqrt{8}$
(b) $x = -1$
(c) There is no real solution.
(d) $x = 1 - \sqrt{2}, \;\; x = 1 + \sqrt{2}$

28. Solve the equation $\left|\frac{1}{3}x - 1\right| + 3 = 7.$

(a) -9, 15
(b) -27, 15
(c) -11, 13
(d) 9

29. Solve the inequality $-2 \leq \frac{1}{3}x - 1 \leq 5$

(a) $[-9, 12]$
(b) $[-9, 18]$
(c) $[-5, 16]$
(d) $[-3, 18]$

30. We have invested a total of \$ 5000 in two bank accounts. One account earns 7% interest per year, the other earns 8% per year. How much did we invest at 8% if the combined interest from the two account was \$ 382?

    (a) \$ 1700
    (b) \$ 2500
    (c) \$ 3200
    (d) \$ 4200

31. Find the distance between the points $(-4, -5)$ and $(1, 7)$.

    (a) 13 units
    (b) $\frac{12}{5}$ units
    (c) 17 units
    (d) $\sqrt{119}$ units

32. Simplify the expression $\left(3 - \sqrt{5}\right)^2$.

    (a) 4
    (b) $14 - 6\sqrt{5}$
    (c) $8\sqrt{5}$
    (d) 20

33. Find all real solutions of the equation $x^2 + 2x + 5 = 0$.

    (a) there is no solution among the real numbers
    (b) $-2\sqrt{5}$
    (c) $-1 + \sqrt{6}$ and $-1 - \sqrt{6}$
    (d) $-1 + \sqrt{24}$ and $-1 - \sqrt{24}$