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Solve the following equations.

1. $-19x + 1 = -22$

Solution:

$$\begin{aligned} -19x + 1 &= -22 \\ -19x &= -22 - 1 \\ x &= \frac{23}{19} \end{aligned}$$

2. $4x - 5 = 104$

Solution:

$$\begin{aligned} 4x - 5 &= 104 \\ 4x &= 104 + 5 \\ x &= \frac{109}{4} \end{aligned}$$

3. $-4x + 2 = -90$

Solution:

$$\begin{aligned} -4x + 2 &= -90 \\ -4x &= -90 - 2 \\ x &= 23 \end{aligned}$$

4. $-13x + 1 = 20$

Solution:

$$\begin{aligned} -13x + 1 &= 20 \\ -13x &= 20 - 1 \\ x &= -\frac{19}{13} \end{aligned}$$

5. $-13x + 2 = 107$

Solution:

$$\begin{aligned} -13x + 2 &= 107 \\ -13x &= 107 - 2 \\ x &= -\frac{105}{13} \end{aligned}$$

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6. $2x + 4 = 128$

Solution:

$$\begin{aligned} 2x + 4 &= 128 \\ 2x &= 128 - 4 \\ x &= 62 \end{aligned}$$

7. $-13x + 2 = 49$

Solution:

$$\begin{aligned} -13x + 2 &= 49 \\ -13x &= 49 - 2 \\ x &= -\frac{47}{13} \end{aligned}$$

8. $-13x - 5 = -5$

Solution:

$$\begin{aligned} -13x - 5 &= -5 \\ -13x &= -5 + 5 \\ x &= 0 \end{aligned}$$

9. $7x - 3 = 63$

Solution:

$$\begin{aligned} 7x - 3 &= 63 \\ 7x &= 63 + 3 \\ x &= \frac{66}{7} \end{aligned}$$

10. $-6x - 1 = -51$

Solution:

$$\begin{aligned} -6x - 1 &= -51 \\ -6x &= -51 + 1 \\ x &= \frac{25}{3} \end{aligned}$$

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11. $5(3x-3)-5x=66$

Solution:

$$\begin{aligned} 5(3x-3)-5x &= 66 \\ 15x-15-5x &= 66 \\ 15x-5x &= 66+15 \\ 10x &= 81 \\ x &= \frac{81}{10} \end{aligned}$$

12. $-4(5x+3)-x=104$

Solution:

$$\begin{aligned} -4(5x+3)-x &= 104 \\ -20x-12-x &= 104 \\ -20x-x &= 104+12 \\ -21x &= 116 \\ x &= -\frac{116}{21} \end{aligned}$$

13. $-5(2x-8)+4x=83$

Solution:

$$\begin{aligned} -5(2x-8)+4x &= 83 \\ -10x+40+4x &= 83 \\ -10x+4x &= 83-40 \\ -6x &= 43 \\ x &= -\frac{43}{6} \end{aligned}$$

14. $-4(5x+5)+3x=84$

Solution:

$$\begin{aligned} -4(5x+5)+3x &= 84 \\ -20x-20+3x &= 84 \\ -20x+3x &= 84+20 \\ -17x &= 104 \\ x &= -\frac{104}{17} \end{aligned}$$

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15. $2(x-6)+14x=-34$

Solution:

$$\begin{aligned} 2(x-6)+14x &= -34 \\ 2x-12+14x &= -34 \\ 2x+14x &= -34+12 \\ 16x &= -22 \\ x &= -\frac{11}{8} \end{aligned}$$

16. $3(2x-2)+4x=32$

Solution:

$$\begin{aligned} 3(2x-2)+4x &= 32 \\ 6x-6+4x &= 32 \\ 6x+4x &= 32+6 \\ 10x &= 38 \\ x &= \frac{19}{5} \end{aligned}$$

17. $4(5x-4)-6x=70$

Solution:

$$\begin{aligned} 4(5x-4)-6x &= 70 \\ 20x-16-6x &= 70 \\ 20x-6x &= 70+16 \\ 14x &= 86 \\ x &= \frac{43}{7} \end{aligned}$$

18. $2(5x-2)-5x=30$

Solution:

$$\begin{aligned} 2(5x-2)-5x &= 30 \\ 10x-4-5x &= 30 \\ 10x-5x &= 30+4 \\ 5x &= 34 \\ x &= \frac{34}{5} \end{aligned}$$

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19. $2(4x - 2) + 13x = -50$

Solution:

$$\begin{aligned} 2(4x - 2) + 13x &= -50 \\ 8x - 4 + 13x &= -50 \\ 8x + 13x &= -50 + 4 \\ 21x &= -46 \\ x &= -\frac{46}{21} \end{aligned}$$

20. $-4(2x + 4) + 14x = 46$

Solution:

$$\begin{aligned} -4(2x + 4) + 14x &= 46 \\ -8x - 16 + 14x &= 46 \\ -8x + 14x &= 46 + 16 \\ 6x &= 62 \\ x &= \frac{31}{3} \end{aligned}$$

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21. $\frac{-x+3}{4} = \frac{-2x-4}{7}$

Solution:

$$\frac{-x+3}{4} = \frac{-2x-4}{7}$$
$$(-x+3) \times 7 = (-2x-4) \times 4$$
$$-7x+21 = -8x-16$$
$$-7x+8x = -16-21$$
$$x = -37$$
$$x = -37$$

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

Solution:

$$\frac{-2x-3}{2} = \frac{-3x-4}{6}$$
$$(-2x-3) \times 6 = (-3x-4) \times 2$$
$$-12x-18 = -6x-8$$
$$-12x+6x = -8+18$$
$$-6x = 10$$
$$x = -\frac{5}{3}$$

23. $\frac{-3x-5}{9} = \frac{x+1}{7}$

Solution:

$$\frac{-3x-5}{9} = \frac{x+1}{7}$$
$$(-3x-5) \times 7 = (x+1) \times 9$$
$$-21x-35 = 9x+9$$
$$-21x-9x = 9+35$$
$$-30x = 44$$
$$x = -\frac{22}{15}$$

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

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Solution:

$$\frac{3x+2}{5} = \frac{-x-2}{6}$$
$$(3x+2) \times 6 = (-x-2) \times 5$$
$$18x + 12 = -5x - 10$$
$$18x + 5x = -10 - 12$$
$$23x = -22$$
$$x = -\frac{22}{23}$$

25. $\frac{-x+3}{3} = \frac{-2x-2}{9}$

Solution:

$$\frac{-x+3}{3} = \frac{-2x-2}{9}$$
$$(-x+3) \times 9 = (-2x-2) \times 3$$
$$-9x + 27 = -6x - 6$$
$$-9x + 6x = -6 - 27$$
$$-3x = -33$$
$$x = 11$$

26. $\frac{5x+5}{8} = \frac{-4x+4}{3}$

Solution:

$$\frac{5x+5}{8} = \frac{-4x+4}{3}$$
$$(5x+5) \times 3 = (-4x+4) \times 8$$
$$15x + 15 = -32x + 32$$
$$15x + 32x = 32 - 15$$
$$47x = 17$$
$$x = \frac{17}{47}$$

27. $\frac{5x+3}{4} = \frac{-2x-3}{3}$

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Solution:

$$\frac{5x+3}{4} = \frac{-2x-3}{3}$$
$$(5x+3) \times 3 = (-2x-3) \times 4$$
$$15x + 9 = -8x - 12$$
$$15x + 8x = -12 - 9$$
$$23x = -21$$
$$x = -\frac{21}{23}$$

28. $\frac{-3x+1}{9} = \frac{8x-3}{6}$

Solution:

$$\frac{-3x+1}{9} = \frac{8x-3}{6}$$
$$(-3x+1) \times 6 = (8x-3) \times 9$$
$$-18x + 6 = 72x - 27$$
$$-18x - 72x = -27 - 6$$
$$-90x = -33$$
$$x = \frac{11}{30}$$

29. $\frac{4x-1}{3} = \frac{-4x-4}{4}$

Solution:

$$\frac{4x-1}{3} = \frac{-4x-4}{4}$$
$$(4x-1) \times 4 = (-4x-4) \times 3$$
$$16x - 4 = -12x - 12$$
$$16x + 12x = -12 + 4$$
$$28x = -8$$
$$x = -\frac{2}{7}$$

30. $\frac{8x-1}{6} = \frac{4x+2}{7}$

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Solution:

$$\frac{8x-1}{6} = \frac{4x+2}{7}$$
$$(8x-1) \times 7 = (4x+2) \times 6$$
$$56x - 7 = 24x + 12$$
$$56x - 24x = 12 + 7$$
$$32x = 19$$
$$x = \frac{19}{32}$$

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

Solution:

$$\begin{aligned}
\frac{-2x+1}{3} + \frac{-4x-3}{5} &= -4 \\
\frac{5(-2x+1)}{15} + \frac{3(-4x-3)}{15} &= -4 \\
5(-2x+1) + 3(-4x-3) &= -60 \\
-10x + 5 - 12x - 9 &= -60 \\
-10x - 12x &= -60 - 5 + 9 \\
-22x &= -56 \\
x &= \frac{28}{11}
\end{aligned}$$

32. $\frac{5x-4}{3} + \frac{5x-1}{5} = -1$

Solution:

$$\begin{aligned}
\frac{5x-4}{3} + \frac{5x-1}{5} &= -1 \\
\frac{5(5x-4)}{15} + \frac{3(5x-1)}{15} &= -1 \\
5(5x-4) + 3(5x-1) &= -15 \\
25x - 20 + 15x - 3 &= -15 \\
25x + 15x &= -15 + 20 + 3 \\
40x &= 8 \\
x &= \frac{1}{5}
\end{aligned}$$

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

Solution:

$$\begin{aligned}
\frac{4x-1}{5} + \frac{-5x+1}{2} &= -3 \\
\frac{2(4x-1)}{10} + \frac{5(-5x+1)}{10} &= -3 \\
2(4x-1) + 5(-5x+1) &= -30 \\
8x - 2 - 25x + 5 &= -30 \\
8x - 25x &= -30 + 2 - 5 \\
-17x &= -33 \\
x &= \frac{33}{17}
\end{aligned}$$

34. $\frac{x-3}{4} + \frac{-5x+1}{3} = 1$

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Solution:

$$\begin{aligned}
\frac{x-3}{4}+\frac{-5x+1}{3} &= 1\\
\frac{3(x-3)}{12}+\frac{4(-5x+1)}{12} &= 1\\
3(x-3)+4(-5x+1) &= 12\\
3x-9-20x+4 &= 12\\
3x-20x &= 12+9-4\\
-17x &= 17\\
x &= -1
\end{aligned}$$

35. $\frac{-4x-1}{5}+\frac{-3x+2}{3}=8$

Solution:

$$\begin{aligned}
\frac{-4x-1}{5}+\frac{-3x+2}{3} &= 8\\
\frac{3(-4x-1)}{15}+\frac{5(-3x+2)}{15} &= 8\\
3(-4x-1)+5(-3x+2) &= 120\\
-12x-3-15x+10 &= 120\\
-12x-15x &= 120+3-10\\
-27x &= 113\\
x &= -\frac{113}{27}
\end{aligned}$$

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

Solution:

$$\begin{aligned}
\frac{5x+1}{5}-\frac{-x-5}{4} &= -6\\
\frac{4(5x+1)}{20}-\frac{5(-x-5)}{20} &= -6\\
4(5x+1)-5(-x-5) &= -120\\
20x+4+5x+25 &= -120\\
20x+5x &= -120-4-25\\
25x &= -149\\
x &= -\frac{149}{25}
\end{aligned}$$

37. $\frac{2x+4}{3}-\frac{-2x+4}{2}=-3$

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Solution:

$$\begin{aligned}
\frac{2x+4}{3} - \frac{-2x+4}{2} &= -3 \\
\frac{2(2x+4)}{6} - \frac{3(-2x+4)}{6} &= -3 \\
2(2x+4) - 3(-2x+4) &= -18 \\
4x + 8 + 6x - 12 &= -18 \\
4x + 6x &= -18 - 8 + 12 \\
10x &= -14 \\
x &= -\frac{7}{5}
\end{aligned}$$

38. $\frac{-5x+3}{10} - \frac{3x-5}{3} = 10$

Solution:

$$\begin{aligned}
\frac{-5x+3}{10} - \frac{3x-5}{3} &= 10 \\
\frac{3(-5x+3)}{30} - \frac{10(3x-5)}{30} &= 10 \\
3(-5x+3) - 10(3x-5) &= 300 \\
-15x + 9 - 30x + 50 &= 300 \\
-15x - 30x &= 300 - 9 - 50 \\
-45x &= 241 \\
x &= -\frac{241}{45}
\end{aligned}$$

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

Solution:

$$\begin{aligned}
\frac{3x-5}{5} - \frac{-x+2}{3} &= -3 \\
\frac{3(3x-5)}{15} - \frac{5(-x+2)}{15} &= -3 \\
3(3x-5) - 5(-x+2) &= -45 \\
9x - 15 + 5x - 10 &= -45 \\
9x + 5x &= -45 + 15 + 10 \\
14x &= -20 \\
x &= -\frac{10}{7}
\end{aligned}$$

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

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Solution:

$$\begin{aligned}
\frac{5x+2}{4} - \frac{3x+3}{3} &= -6 \\
\frac{3(5x+2)}{12} - \frac{4(3x+3)}{12} &= -6 \\
3(5x+2) - 4(3x+3) &= -72 \\
15x + 6 - 12x - 12 &= -72 \\
15x - 12x &= -72 - 6 + 12 \\
3x &= -66 \\
x &= -22
\end{aligned}$$