School786
AN ONLINE SCHOOL

Name: Due Date: Teacher: Parent Sign:

1. Explain why performing the same operation to both sides of an equation preserves equality.

2. What happens if you multiply both sides of an equation by 0 when solving? Why is that not a valid solving step?

3. When you multiply both sides of an equation by an expression that contains the variable (for example, multiply both sides by x), why must you check your solution(s) afterwards?

4. Explain why subtracting the same variable term from both sides is useful when an equation has variables on both sides.

5. If you divide both sides of an equation by an expression that could be zero, what precaution must you take?

6. Consider $2(x + 3) = 2x + 6$. Without solving step-by-step, what can you say about the solutions of this equation?

7. Solve: $3x + 5 = x + 13$.

8. Solve: $5x - 9 = 2x + 12$.

9. Solve: $4x + 7 = -2x + 19$.

10. Solve: $-3x + 4 = 5x - 16$.

11. Solve: $2(x + 3) = x + 11$.

12. Solve: $x/2 + 4 = 3x/4 + 1$.

13. Solve: $20 - 7x = 6x - 6$.

14. Solve: $18 - 5x = -2x + 12$.

15. Solve: $-10 + 4x = 9x - 35$.

16. Solve: $7 - 3x = 2(1 - 2x)$.

17. Solve: $2(4 - x) = 3x + 1$.

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

19. Solve: $(\frac{5}{6})x + 3 = (\frac{1}{3})x + 7$.

20. Solve: $x/5 - 2 = (2x + 5)/10$.

21. Solve: $(x + 2)/3 = (2x - 1)/2$.

22. Solve: $(4x - 3)/5 = x/2 + 1$.

23. Solve: $7 - (\frac{1}{3})x = (\frac{1}{6})x + 5$.

24. Solve for x (and state any restrictions): $4/x + 2 = 6$.

25. Solve for x (and state any restrictions): $3/(x + 1) = 2$.

26. Solve for x (and state any restrictions): $6/x = x - 1$.

27. Solve for x (and state any restrictions): $(2x + 3)/x = 5$.

28. Solve for x (and state any restrictions): $4/(x - 2) = 2$.

29. Solve for x (and state any restrictions): $3/(2x) + 1 = 5$.

30. Solve for x (and state any restrictions): $1/x + 1/(x + 2) = 1$.

31. Solve for x (and state any restrictions): $2/(3x) = 4/(x + 1)$.

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Word problems (model each situation and solve)

32. Two scooter-rental companies: Company A charges 20plus3 per hour; Company B charges 14plus5 per hour. For how many hours h are the costs equal?

33. Sophie's current age is S years. In 5 years she will be 3 times as old as she was 2 years ago. Write an equation and find S.

34. A rectangle's length is 4 units less than twice its width. If the perimeter is 44 units, find the width.

35. Two phone plans: Plan A charges 8plus0.75 per minute, Plan B charges 5plus1.25 per minute. For how many minutes m are the costs the same?

36. A number decreased by 7 equals one?third of the same number plus 5. Find the number.

37. Michael says: "My number plus 4 equals three times my number minus 10." Find Michael's number.

38. A sweater's sale price is $12 off the original price. The sale price also equals three-quarters of the original price minus 6.$ Find the original price.

39. Two personal trainers: Trainer A charges 20plus15 per hour, Trainer B charges 30plus10 per hour. For how many hours h are their charges equal?

40. Solve for x: four times a number minus 6 equals the number plus 10. (Write the equation and solve.)

41. Two taxi services: Taxi A charges 3plus2 per mile; Taxi B charges 5plus1.50 per mile. For how many miles m will the fares be the same?

42. Half of a number plus 7 equals twice the number minus 5. Find the number.

43. A rectangle's length is 3 units greater than its width. If the perimeter is 26, find the width.

44. A cyclist rides x miles the first day and x + 12 miles the second day for a total of 88 miles. Find x.

45. Three friends split a restaurant bill equally; each pays $a. If a fourth friend had joined, each person would have paid 6$ less. Find a.

More practice (mixture of fractions, denominators, identities, no-solution)

46. Solve: (x + 1)/2 + (x - 1)/3 = x.

47. Solve for x (state restrictions): 5/x + 2 = x/2.

48. Solve: 2(x + 3) = 2x + 7. (What type of solution does this produce?)

49. Solve: 3(2x - 1) = 6x - 3. (What type of solution does this produce?)

50. Two mechanics: one can finish a job in x hours, the other in x + 2 hours. Working together they finish the job in 3 hours. Find x (only physically meaningful solutions).