Grade 6 Mathematics

Topic 4: Review Questions

35 Questions | All Lessons 4-1 through 4-10

Name: _____ **Section:** _____

4-1 | Understand Equations and Solutions

1. Which value makes $3n + 5 = 23$ true: $n = 4, 5, 6,$ or 7? Substitute each possible value and justify your choice.

2. For $n = 8$, determine whether $3n + 12 = 36$ is true. Is the equation true for $n = 10$? Show both substitutions.

4-2 | Apply Properties of Equality

3. Starting with $x + 17 = 46$, write the equivalent equation after applying the same inverse operation to both sides. Solve for x and check.

4. A student tries to isolate m in $5m = 72.5$ and writes $5m \div 5 = 72.5 \div 10$. Explain the error, then solve the equation correctly.

5. Are $4p = 36$ and $4p - 4 = 36 - 4$ equivalent equations? Explain. Then isolate p using the most efficient operation.

4-3 | Addition and Subtraction Equations

6. Solve $a - 18.75 = 37.6$. Show which operation keeps the equation balanced.

7. Solve $105 = b + 39.8$. Check your answer by substitution.

8. A library received 48 donated books. It now has 367 books. Write a one-step equation for the original number of books, and solve it.

9. A race is 18.6 km long. A runner completed 7.35 km in the first stage and 5.8 km in the second stage. Write an equation and find the distance remaining.

4-4 | Multiplication and Division Equations

10. Solve $14x = 301$. Show how to keep the variable alone.

11. Solve $d \div 8 = 23.75$. Check your answer.

12. Seven equal crates hold a total of 136.5 kilograms of oranges. Let k be the mass in each crate. Write and solve an equation.

13. A student reads 13 pages each day and finishes 286 pages. Let d be the number of days. Write and solve an equation; explain the inverse operation.

4-5 | Equations with Rational Numbers

14. Solve $0.24p = 1.68$. Check using multiplication.

15. Solve $z \div \frac{3}{4} = 12$. Explain which inverse operation isolates z.

16. Solve $\frac{5}{8}f = \frac{15}{4}$. Express your answer in simplest form.

17. A scarf requires $\frac{3}{4}$ meter of fabric. A tailor uses 7.5 meters of fabric to make identical scarves. Write and solve an equation for the number of scarves.

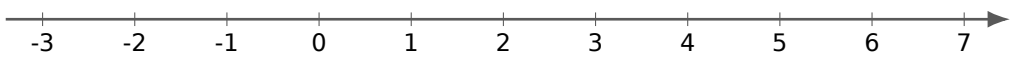
4-6 | Understand and Write Inequalities

18. A van can carry no more than 52 passengers. Let p be the number of passengers. Write an inequality. Explain whether $p = 52$ and $p = 53$ are allowed.

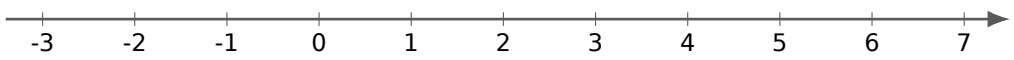
19. A swimming pool must stay at least $78°$F but no warmer than $86°$F. Write two inequalities for temperature t. Does $86°$F satisfy the rules?

4-7 | Solve and Graph Inequalities

20. Graph $w < 2.5$ on the number line. Use an open or closed circle correctly, and shade the appropriate side.



21. Graph $n \geq -1$ on the number line. Then list three integer solutions.



22. For $t < 3.25$, select every solution from $3,\ 3.25,\ 3.2,\ 3.5,$ and 0. Explain why the boundary number is or is not included.

4-8 | Dependent and Independent Variables

23. A plant is measured weekly. Its height h changes as the number of weeks w increases. Identify the independent and dependent variables, and explain why.

24. A delivery service charges \$5 plus \$2.50 per mile. Total cost is $C = 5 + 2.50m$. Identify the input and output variables. Find the cost for 6 miles.

4-9 | Use Patterns to Write and Solve Equations

25. Complete the rule for the table: $x = 0, 1, 2, 3, 4$ and $y = 7, 11, 15, 19, 23$. Write an equation for y in terms of x, and predict y when $x = 12$.

26. A table has $t = 0, 2, 4, 6$ and $d = 5, 11, 17, 23$. Determine how d changes per 1-unit increase of t. Write a rule and find d when $t = 10$.

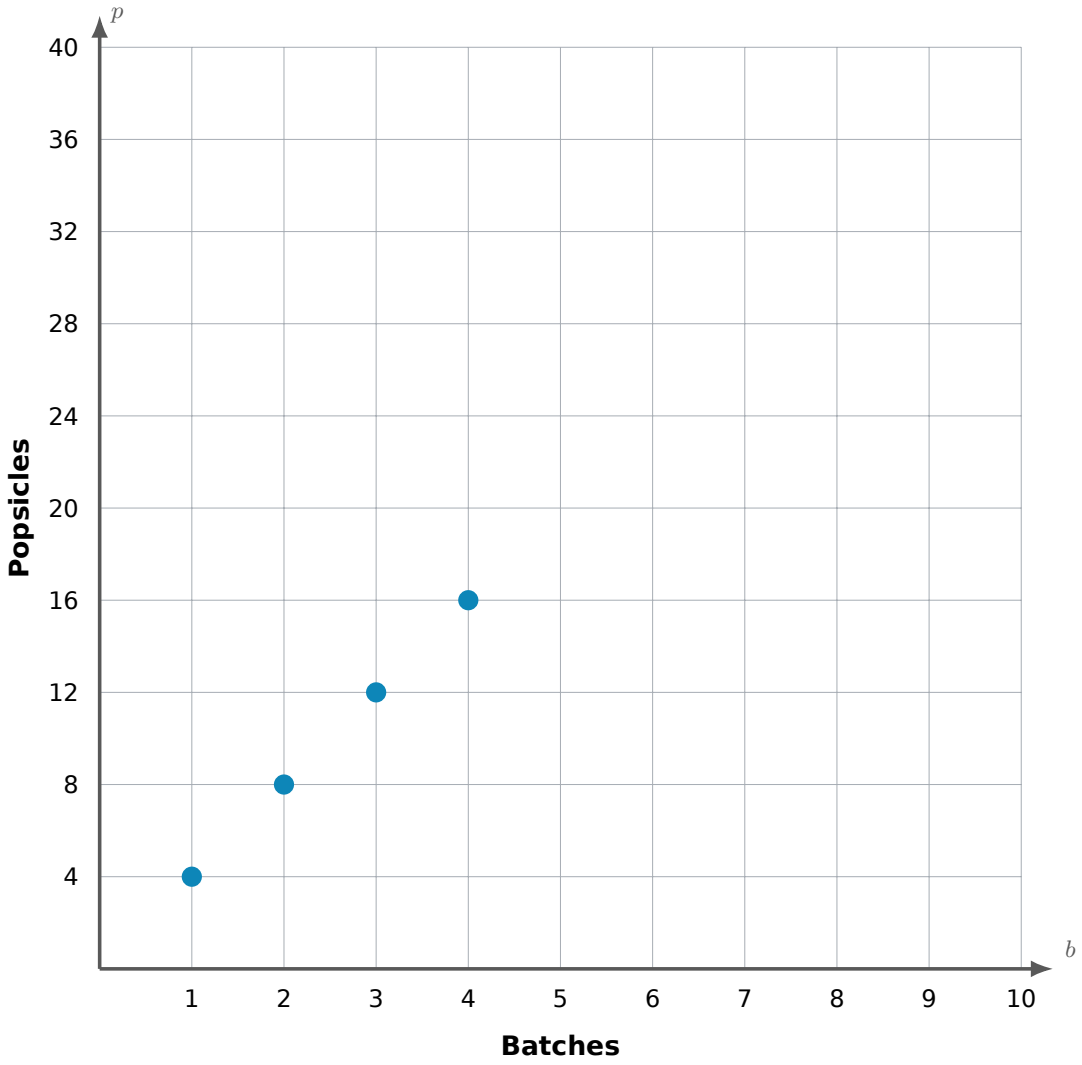
27. A machine starts with 32 tokens and uses 5 tokens for each game. Complete this pattern for games $p = 0, 1, 2, 3, 4$; write an equation for tokens q left; find q after 5 games.

28. A fair charges \$7 admission plus \$2.75 for each ride. Write C in terms of the number of rides r. Complete the table for $r = 0, 2, 4, 6$; then find C for 8 rides.

29. Use $n = \frac{r}{4} - 2$ to complete the output table for $r = 4, 8, 12, 20$. Then find the input r that makes $n = 4$.

4-9 | Patterns and Variable Relationships

30. Meg makes lemon popsicles in batches. The graph shows the relationship between the number of batches, b, and the total number of popsicles, p. Study the plotted points.



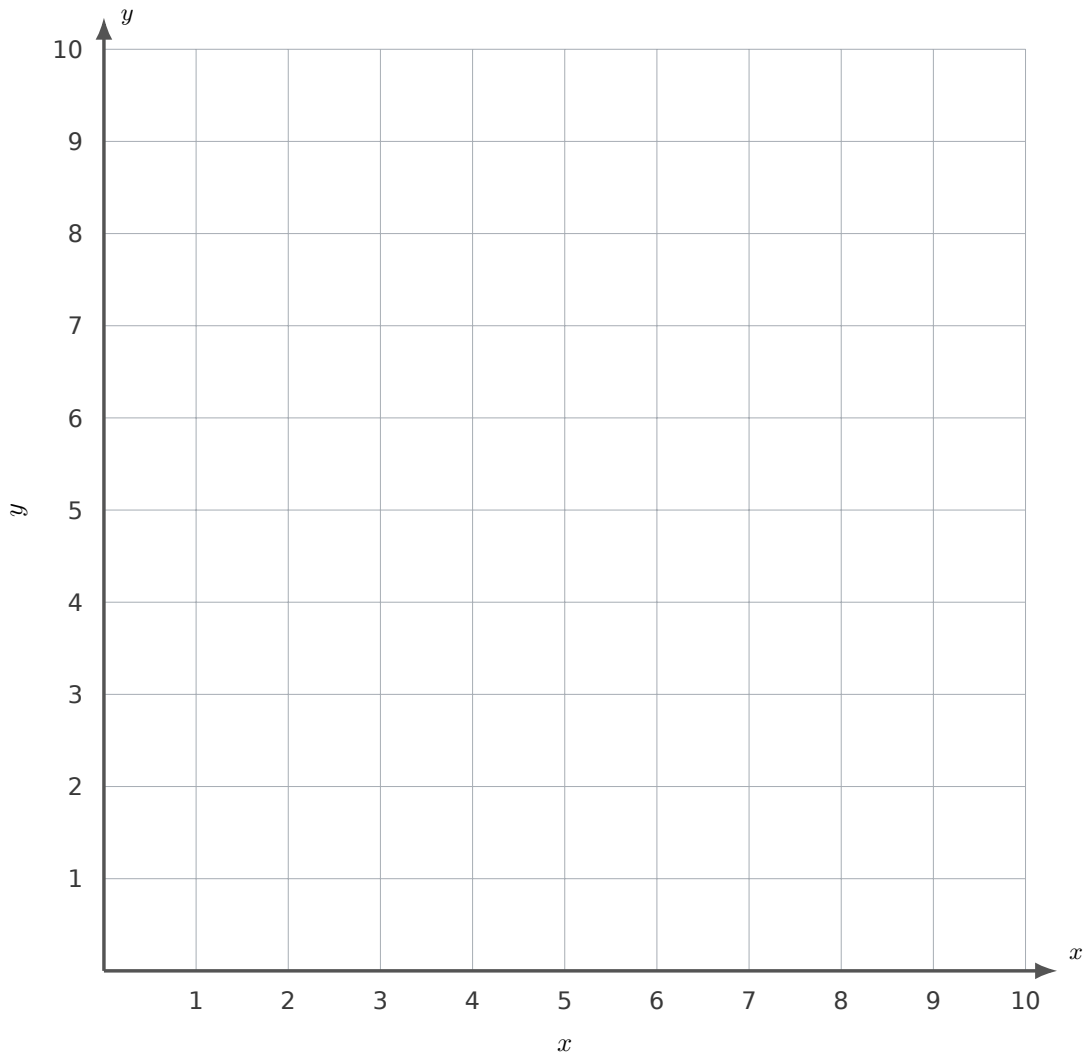
a. Which variable is independent and which is dependent? Explain.

b. How many popsicles are made per batch? Describe the relationship.

c. Write an equation relating p and b. Predict the number of popsicles from 7 batches.

4-10 | Relate Tables, Graphs, and Equations

31. A table gives $x = 0, 1, 2, 3, 4$ and $y = 1, 3, 5, 7, 9$. **(a)** Write an equation. **(b)** Plot the five ordered pairs. **(c)** Describe the pattern.



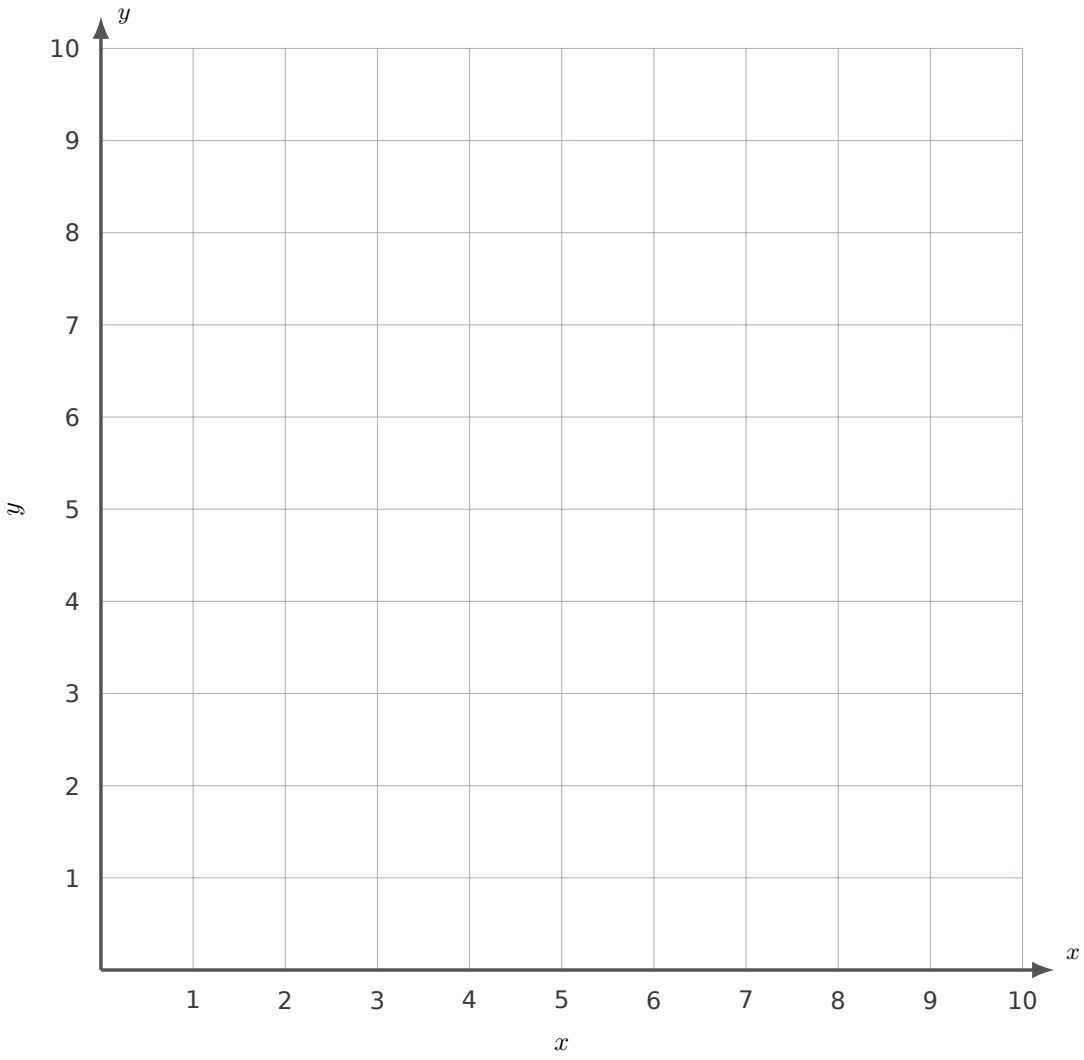
4-10 | Table to Equation to Graph

32. Use the equation below to complete the table, then plot each ordered pair on the graph. Label the dependent and independent variables.

$y = x + 4$

Input-output table

x	y
1	
2	
3	
4	

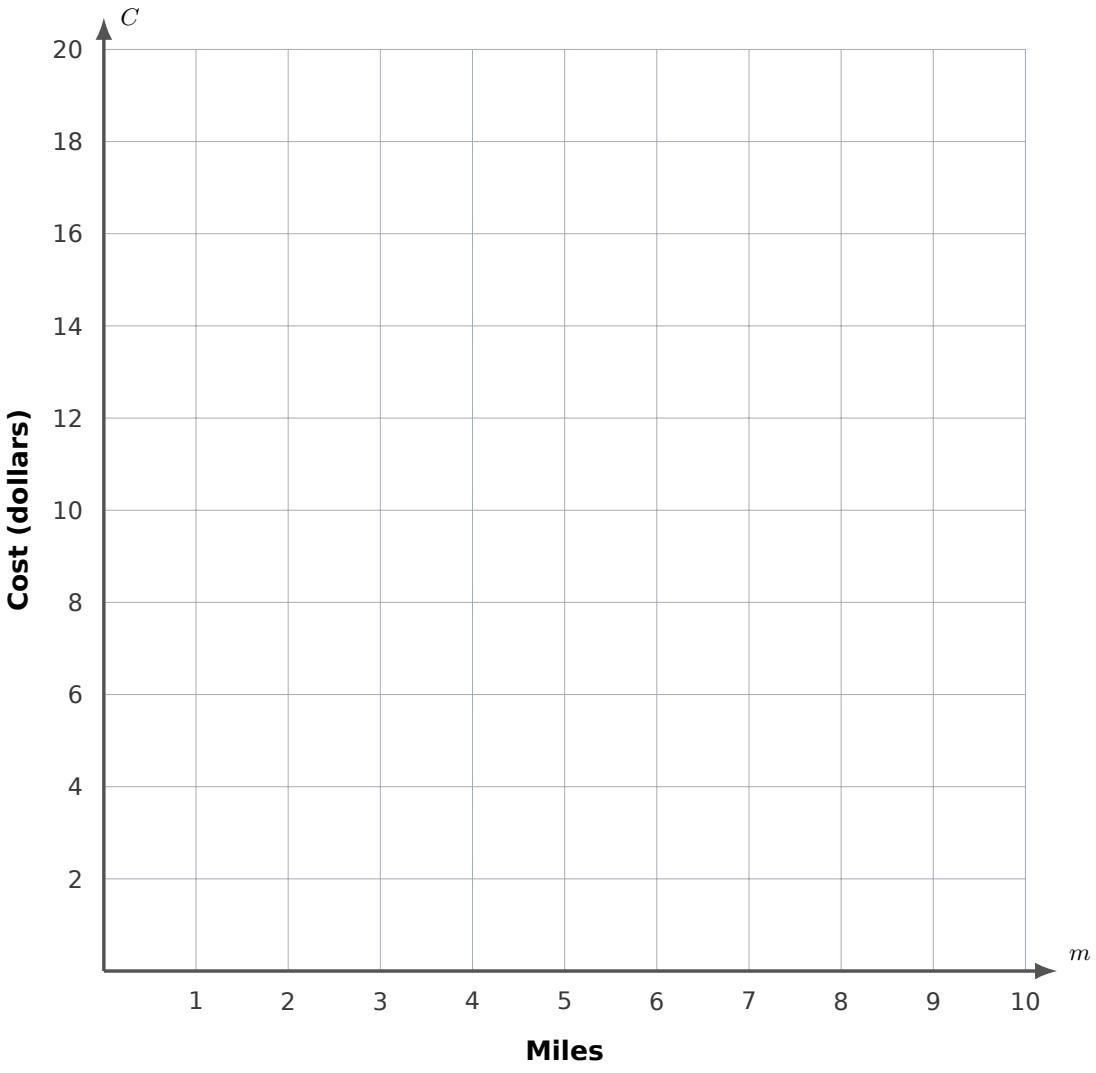


Describe the pattern:

4-10 | Tables, Graphs, and Equations

33. A rental costs \$10 plus \$2 per mile. **(a)** Write C in terms of m. **(b)** Make a table for $m = 0, 1, 2, 3, 4$. **(c)** Plot the five points. Use \$2 for each vertical square.

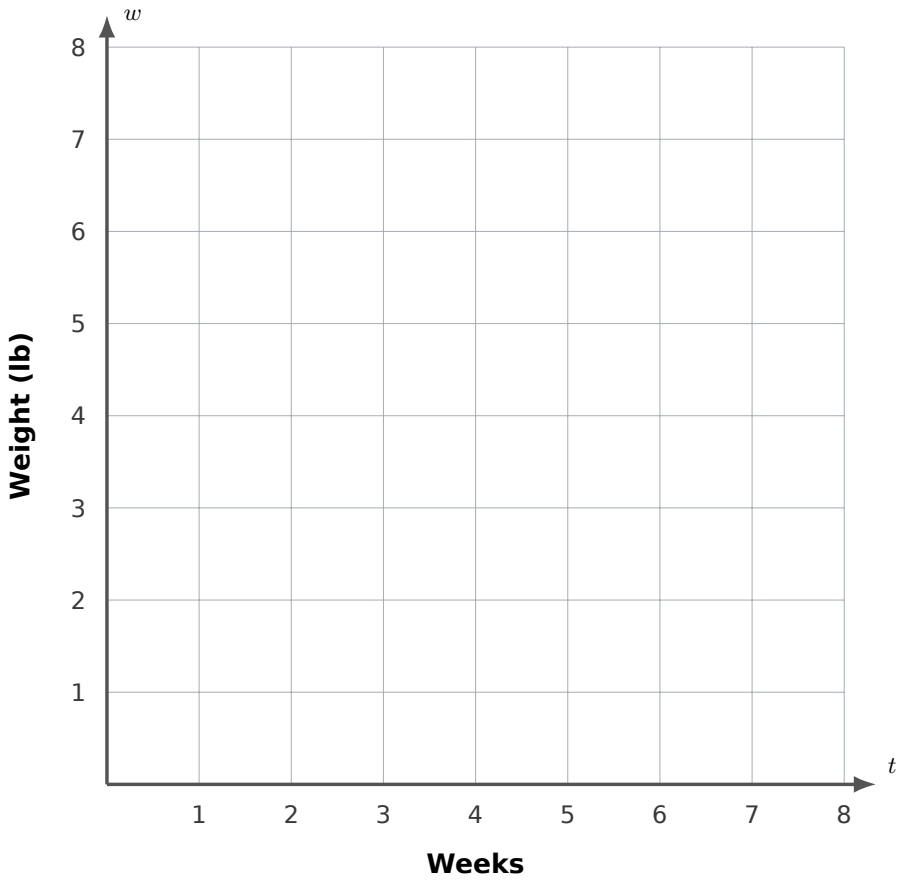
Miles (m)	0	1	2	3	4
Cost (C)					



4-10 | Mixed-Fraction Equation and Graph

34. A puppy weighs $1\frac{1}{2}$ pounds and gains $\frac{1}{2}$ pound each week. Let t be weeks and w be weight. Use $w = 1\frac{1}{2} + \frac{1}{2}t$ to complete the table. Graph the points and describe how weight depends on time.

Weeks (t)	1	3	5	7
Weight (w)				



4-10 | Representing a Relationship

35. An empty shipping box has mass 2 kg. Each book adds 0.5 kg. Write an equation for mass w and number of books b. Make a table for $b = 0, 2, 4, 6, 8$ and graph the points. Explain the starting value.

Books (b)	0	2	4	6	8
Mass (w)					

