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Algebra review

Solve each systems problem. Use two variables and write two equations, then solve. Show the check.

Word Problem Wednesday

1. After the BECA ice skating trip, Dr. Huson took 11 students to get something to eat. Some get chicken fingers, which cost $4 each, and the rest just get french fries, which cost $2.50 each. The total cost was $37.50. Dr. Huson got chicken. How many students got french fries?

   Use c for the number of chicken orders and f for the number of french fry orders. Complete the table of costs below.

c	f	chicken cost	fries cost	total cost
1	11			
2	10			
3	9			
4	8			
5	7			
6	6			
7	5			
8	4			

   Write two equations modeling the situation, one adding up to 12 people, the other adding up to $37.50. Then solve them.

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2. BECA sells tickets to the championship volleyball game, collecting $77. Tickets are $5 for adults and $1 for students. In total, 45 tickets were sold. How many of each type of ticket were sold?

Use a for the number of adult tickets and s for the number of student tickets. Complete the table of ticket sale proceeds below.

a	s	adult total	student total	total proceeds
0	45			
3	42			
6	39			
9	36			
12	33			

Write two equations modeling the situation, one adding up to 45 tickets, the other adding up to $77.00. Then solve them.

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Solve each linear problem. Use x as the variable. Show the check.

3. A DJ charges $225 to play for a party plus $80 per hour. The total for one event was $625.

(a) What would this problem ask you to solve for?

$x =$ the number of _____

(b) Make a table of x and the cost. Start with $x = 0$

x	cost
0	
1	
2	
3	
4	
5	
6	

Show the row differences. Circle the row in the table with the right cost.

(c) Write an equation for the problem of the form $y = mx + b$, and solve it for x

(d) Check the answer

(e) Spicy: How much would be the tax at 11% on the total charge?

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For each problem, use x as the variable, make a table, write an equation, solve it, and show the check.

4. Debbie has collected two dozen plastic bottles to recycle. She plans to collect an additional 24 bottles each week. Her goal is to collect a total of 120.

5. A plane rental service charges a $1500 deposit and $300 per hour to rent a small aircraft. Alex has budgeted $3000 to spend on a day trip.

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6. The entrance fee at Six Flags is $17.50 and each ride costs $1.50. Elizabeth has $35.

7. A basketball free throw video game gives you a starting score of 100 points, and you lose 2 points with each miss. Ishmael wants to stop when he reaches 24 points.

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8. There are two cable TV plans. Disney has a start-up fee of $75 and costs $25 per month. The HBO plan costs $5 to start, but charge $40 per month. After how many months will they cost the same?

9. Dr. O'Grady's Swedish ivy plant is $2\frac{1}{2}$ inches tall and grows one-half inch per week. His poison ivy cutting is 1 inch long and grows $\frac{3}{4}$ inches per week. After how many weeks will the poison ivy be the longer plant?

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Graphing linear functions

Use pencil for graphs. Mark at least some of the values on each axis. Label each function with its name or equation.

10. Two sisters play a card game to win points. Juliana wins 2 points in each hand, while her little sister only wins 1 point per hand. To be fair, Juliana gives her sister 3 points to begin with as a handicap.
    The game is to seven points.

   (a) Make a table showing how many points each sister has with each hand played.

   (b) Write down the slope of both sister's scores based on the differences.

   (c) Draw a line on the graph representing the score of each sister.

   (d) Label the intersection T for "tied."

   (e) On the x-axis mark 7 as the end of the game.

   (f) Who wins?

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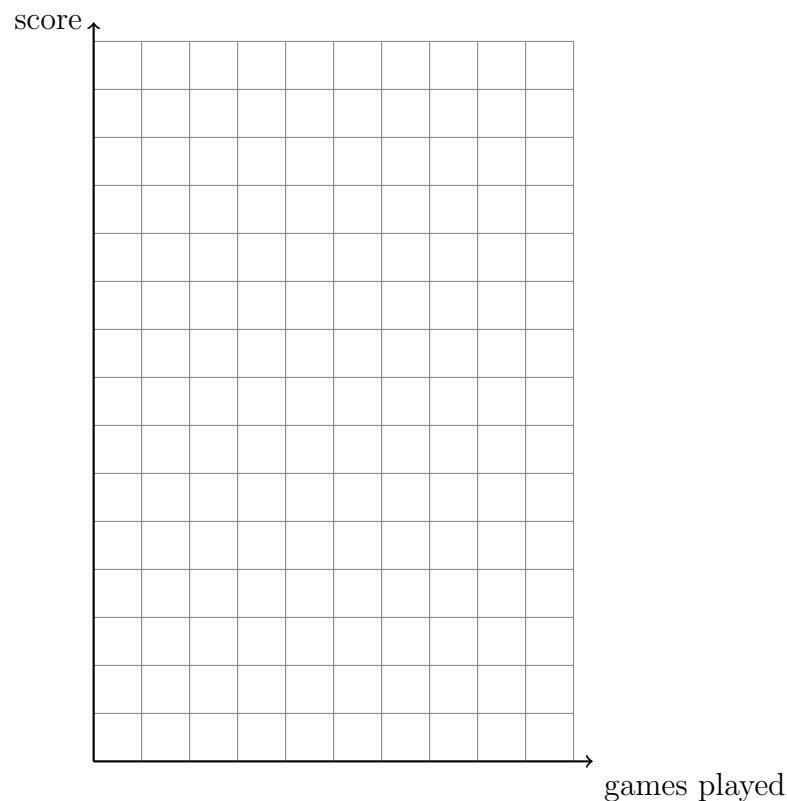
11. $4x^2 + 3x - 7 - 2x^2 - x + 4$

12. $3(a^2 - 2a + 1) - 2(a^2 - a - 4)$

Solve equations

Solve for the value of x.

13. $10 = x - 3x$

14. $\frac{1}{2}(6 - 2x) = 4x$

15. $11 = \frac{1}{3}x + 2x - 10$

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Slope-intercept form

What is the slope and y-intercept of each equation?

16. $y = 2x - 3$

17. $4x + 2y = 6$

Function substitution

18. Given $f(x) = 4x + 7$. Simplify $f(2)$.

19. Given $f(x) = -\dfrac{(12 + 4x)}{11}$. Simplify $f(-3)$.

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20. (a) Mark and label the point $P(4,5)$ on the graph below.

(b) The line L_1 has a y-intercept of 3 and passes through point P. Graph L_1.

(c) What is the slope of line L_1?

(d) What is the equation of line L_1?

(e) A second line, L_2 has the equation $3x + 4y = -8$. Plot L_2 on the graph.

(f) On the graph, mark the intersection of the two lines, Q, as an ordered pair.

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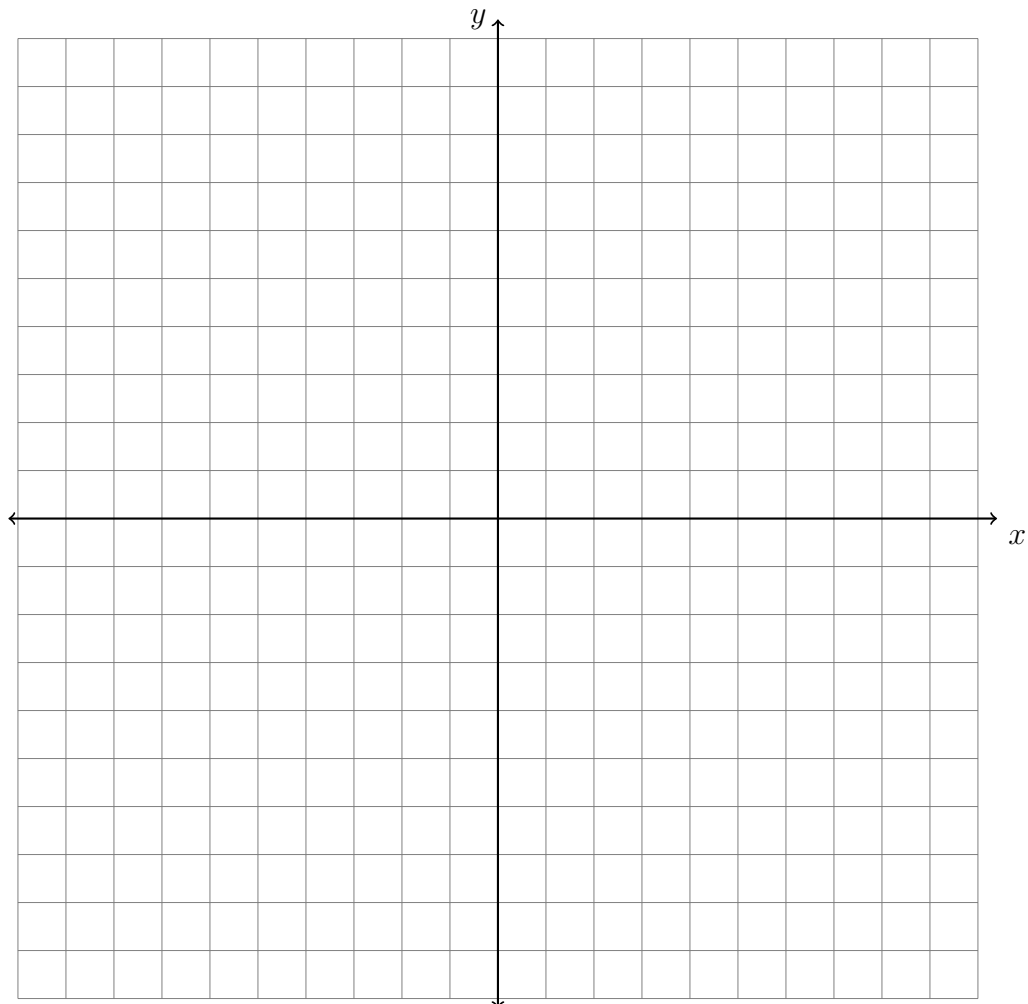
21. Solve the system of equations by graphing each line and marking the intersection as
    an ordered pair.

$$x + y = 7$$

$$y = 3x + 3$$

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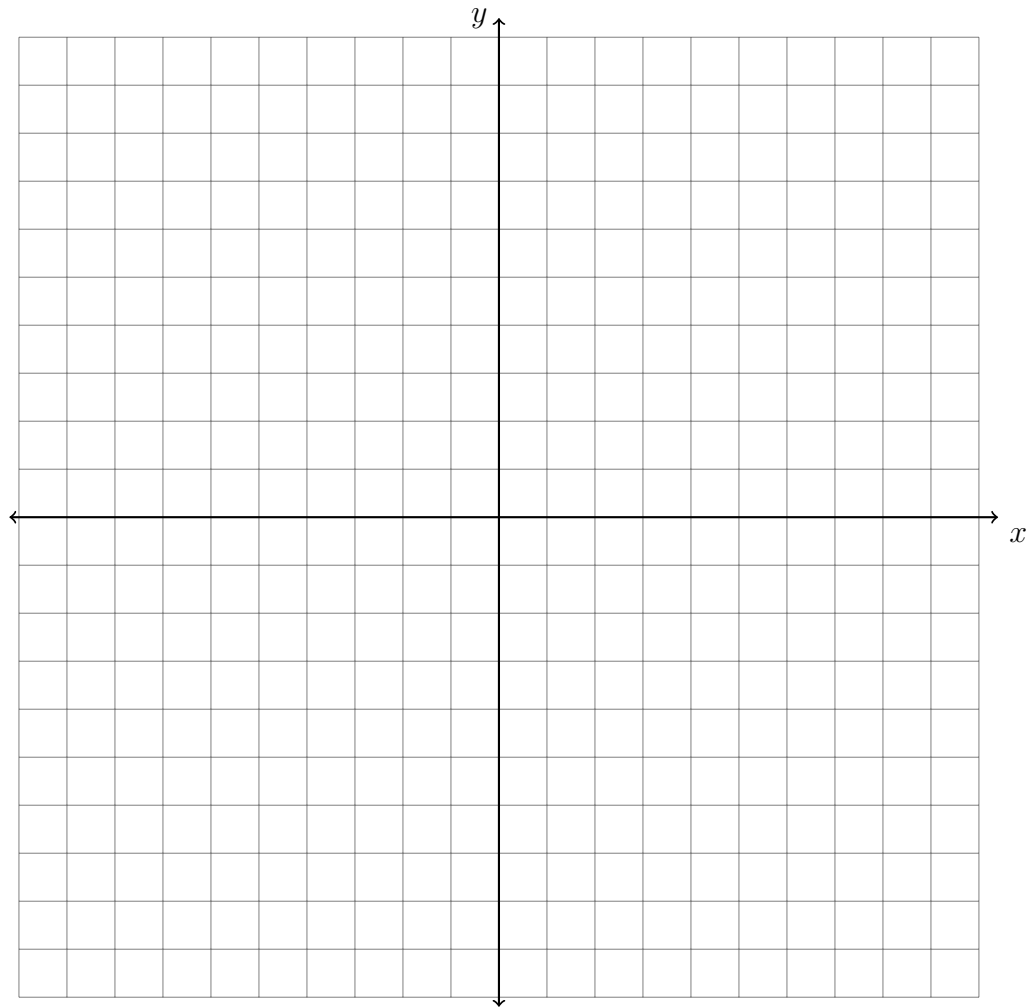
Solve each system algebraically.

22. $2x - 4y = 14$
    $5x + 4y = 7$

23. $2x - y = -7$
    $3x + 4y = 17$

24. Is the expression $2 - \sqrt{5}$ rational, irrational, or neither? Explain.

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25. Oceanside Bike Rental Shop charges a 17 dollar bike fee plus 6 dollars an hour for renting a bike. Jeffrey paid 53 dollars total. How many hours did he pay to have the bike checked out?

26. Three friends go bowling. The cost per person per game is $5.30. The cost to rent shoes is $2.50 per person. Their total cost is $55.20. How many games did they play?

27. The admission fee at a small fair is $1.50 for children and $4.00 for adults. On a certain day, 40 people enter the fair and $85.00 is collected. How many children and how many adults attended?

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Parallel and perpendicular linear equations

28. What is the equation of the line with a slope of 2 passing through the point $(0, 1)$?

29. What is the equation of a line parallel to $y = -2x + 1$ with a y-intercept of 4?

30. What is the slope of a line perpendicular to the line $x - 2y = 16$?