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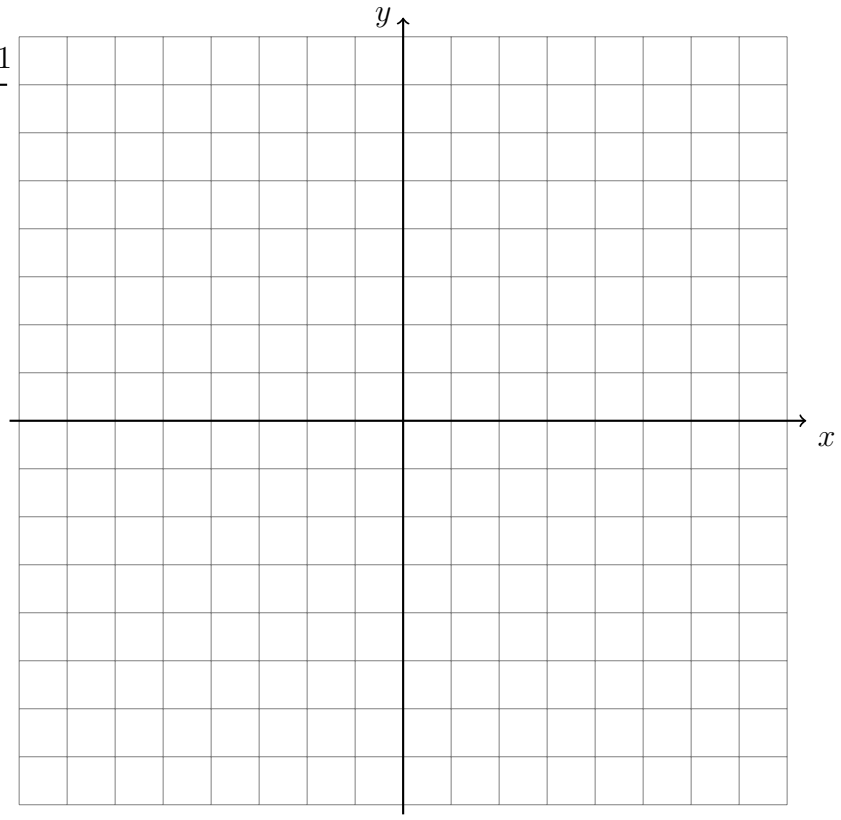
Monday modeling

Show your work. For graphs, use a pencil and straight edge.

Graphing linear functions

1. Fill in the T-chart, plot the points, and draw the line.

x	$y = x + 1$



Write down the slope and y-intercept of the line.
$m =$

$b =$

Circle the row for the y-intercept.

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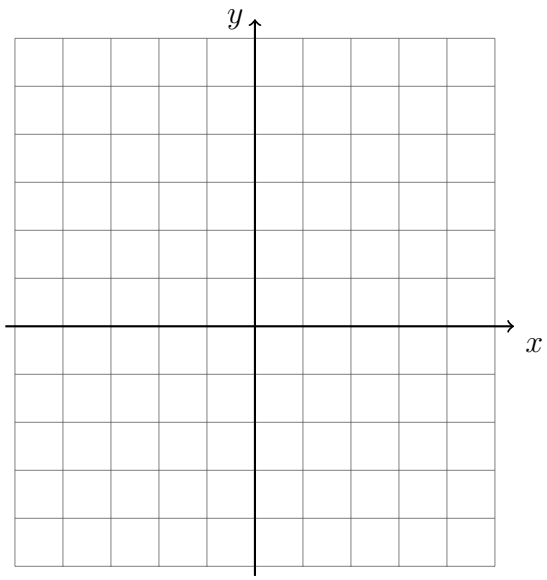
2. Find the slope of the function from the line differences.

x	$f(x)$
-1	-3
0	-1
1	1
2	3
3	5

Graph the function as a line over the domain $-1 \leq x \leq 3$.



Simplify each expression ("Collect like terms")

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

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

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Solve equations

Solve for the value of x.

5. $10 = x - 3x$

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

7. $11 = \frac{1}{3}x + 2x - 10$

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Slope-intercept form

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

8. $y = 2x - 3$

9. $4x + 2y = 6$

Function substitution

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

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

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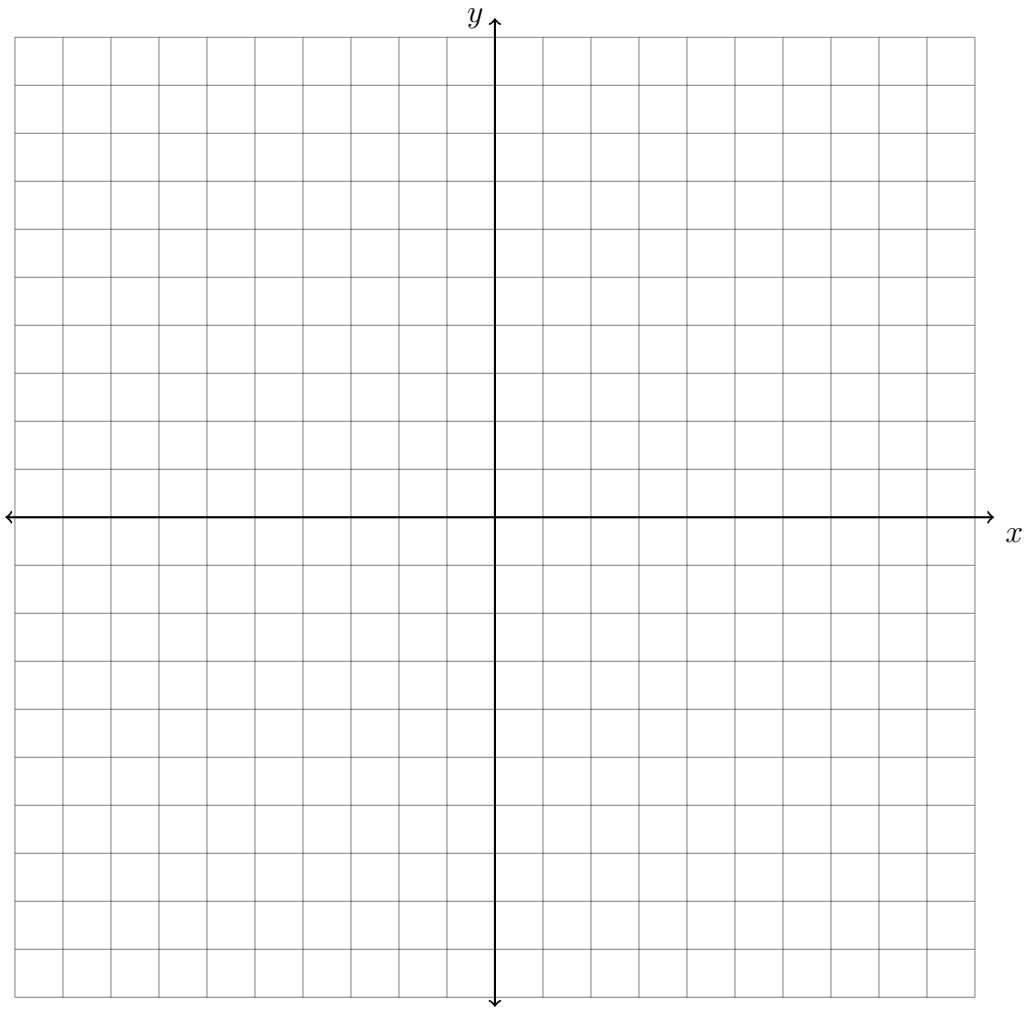
Graphing linear functions

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

12. Given the function $f(x) = -\frac{1}{2}x + 4$.
    (a) Write down the y-intercept.
    (b) Write down the slope of $f(x)$.
    (c) Draw the function $f(x)$ on the graph below.
    (d) Label the intersection of $f(x)$ with the x-axis as the point P.
    (e) Mark and label the point $Q(-2, 2)$.
    (f) A second line, $g(x)$, is parallel to $f(x)$ and passes through point Q. Plot $g(x)$ on the graph.
    (g) What is the y-intercept of $g(x)$?



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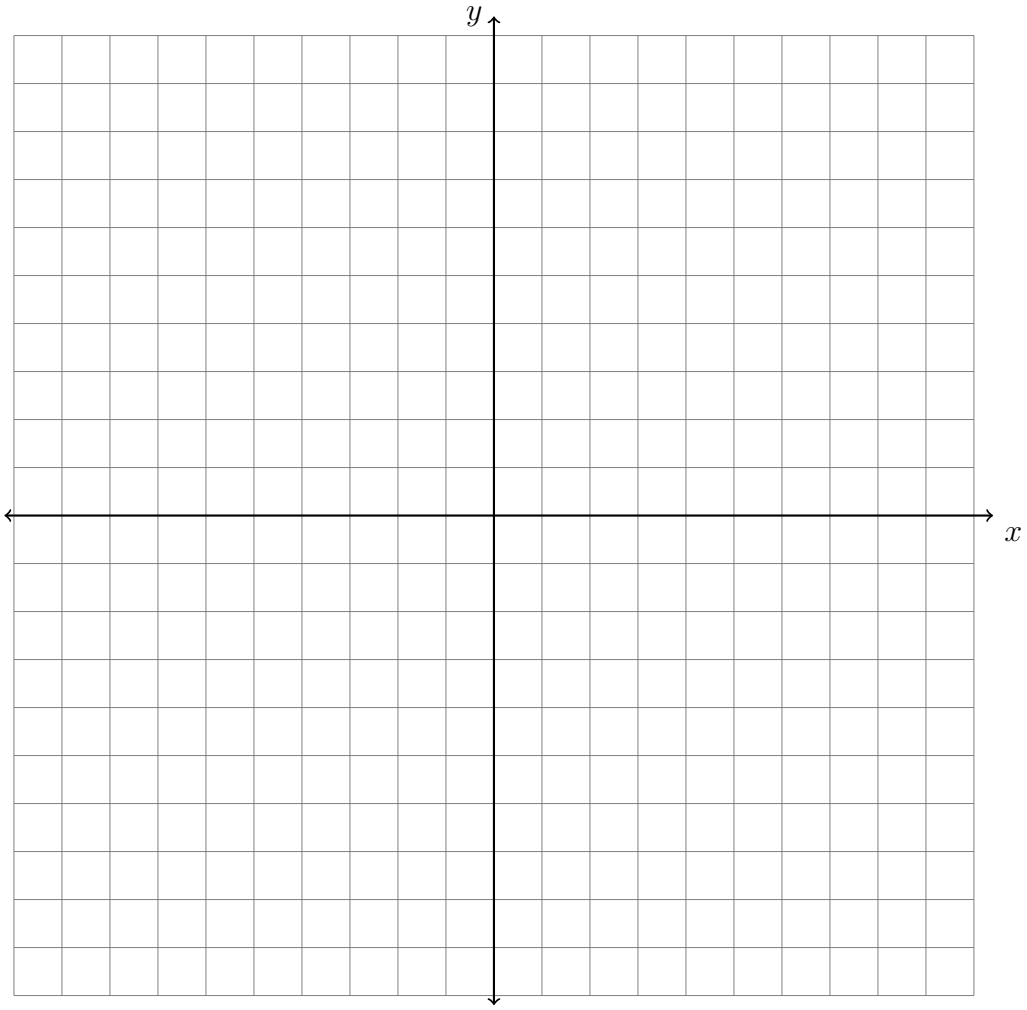
13. (a) Mark and label the point $P(4, 5)$ on the graph below.
    (b) The line L_1 has a y-intercept of 3 and passes through point P. Graph L_1.
    (c) What is the slope of line L_1?

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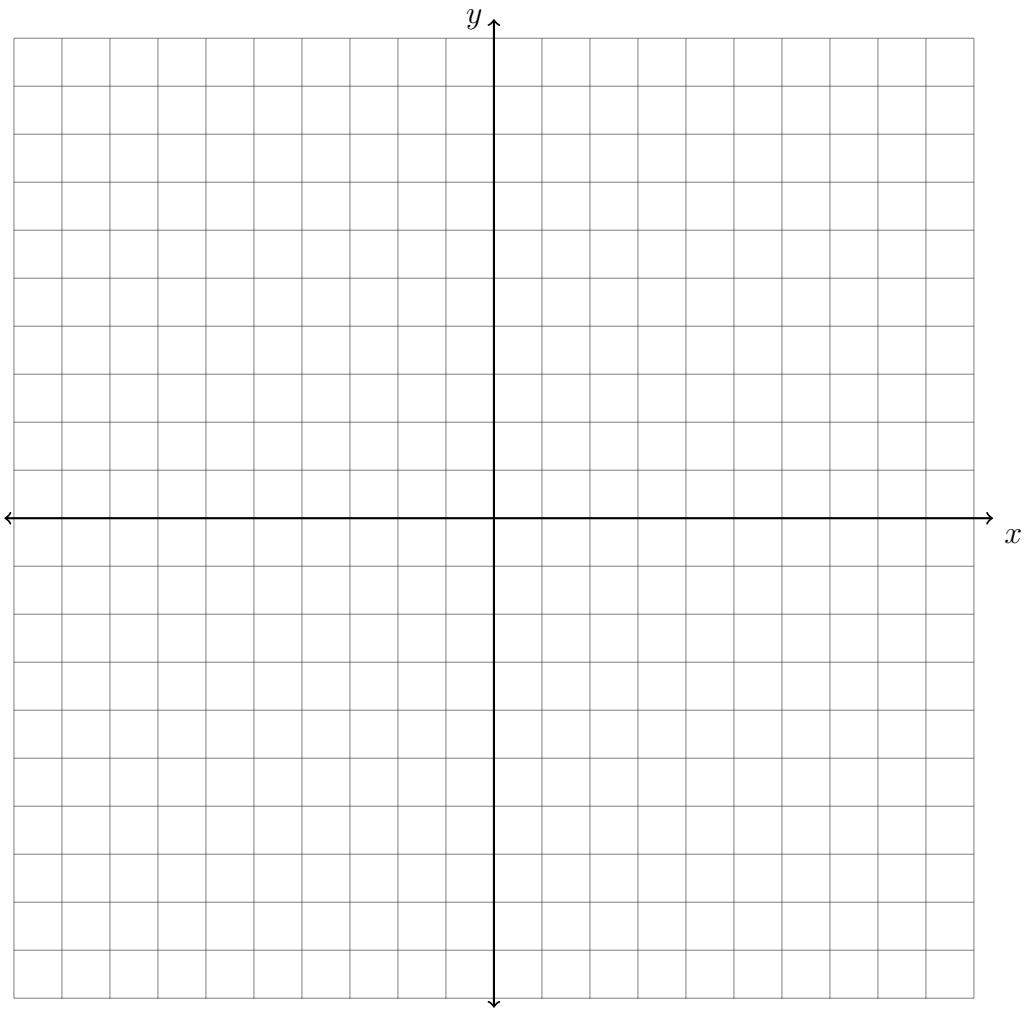
14. Solve the system of equations by graphing each line and marking the intersection as an ordered pair.

$$x + y = 7$$

$$y = 3x + 3$$



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Solve each system algebraically.

15. $2x - 4y = 14$
$5x + 4y = 7$

16. $2x - y = -7$
$3x + 4y = 17$

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

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18. 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?

19. 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?

20. 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

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

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

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