BECA / Huson / 11.2 Algebra II Name:
29 November 2017

Final Exam: Linear functions and graphing

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

Simplify expressions

Simplify by collecting like terms.

1. $4x^2 + 3x - 7 - 2x^2 - x + 4$

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

Solve equations

Solve for the value of x.

3. $10 = x - 3x$

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

5. $11 = \frac{1}{3}x + 2x - 10$

Slope-intercept form

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

6. $y = 2x - 3$

7. $4x + 2y = 6$

Parallel and perpendicular linear equations

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

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

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

Function substitution

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

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

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.

13. Given the function $f(x) = -\frac{1}{2}x + 4$.

    (a) Write down the y-intercept.

    (b) Write down the slope of $f(x)$.

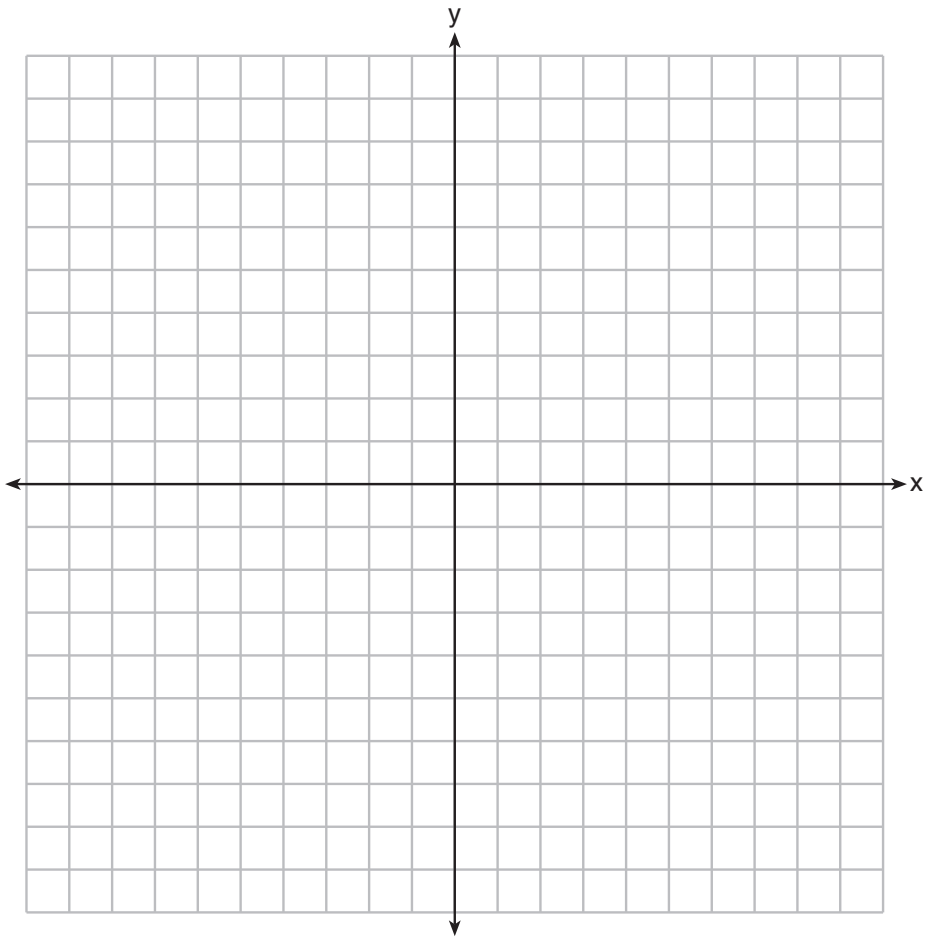
    (c) Draw the function $f(x)$ on the graph below.

    (d) Label the intersection of $f(x)$ with the x-axis as the point P.

    (e) Mark 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 $g(x)$?



14. (a) Mark the point $P(4, 5)$ on the graph.

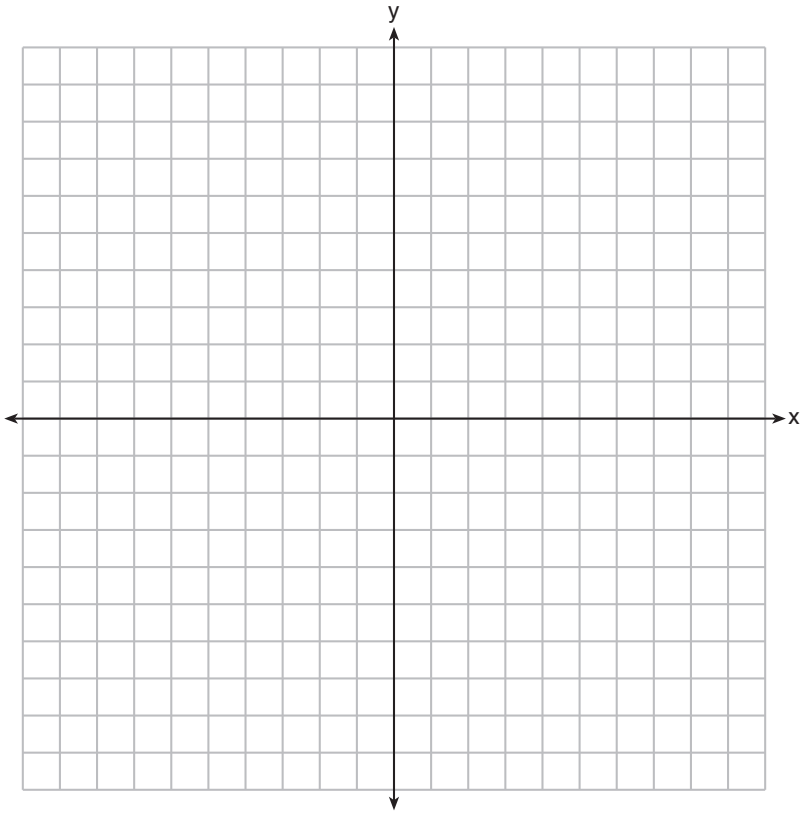
(b) The line L_1 has a y-intercept of 3 and passes through point P. Graph L_1.

(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, the point Q, as an ordered pair.

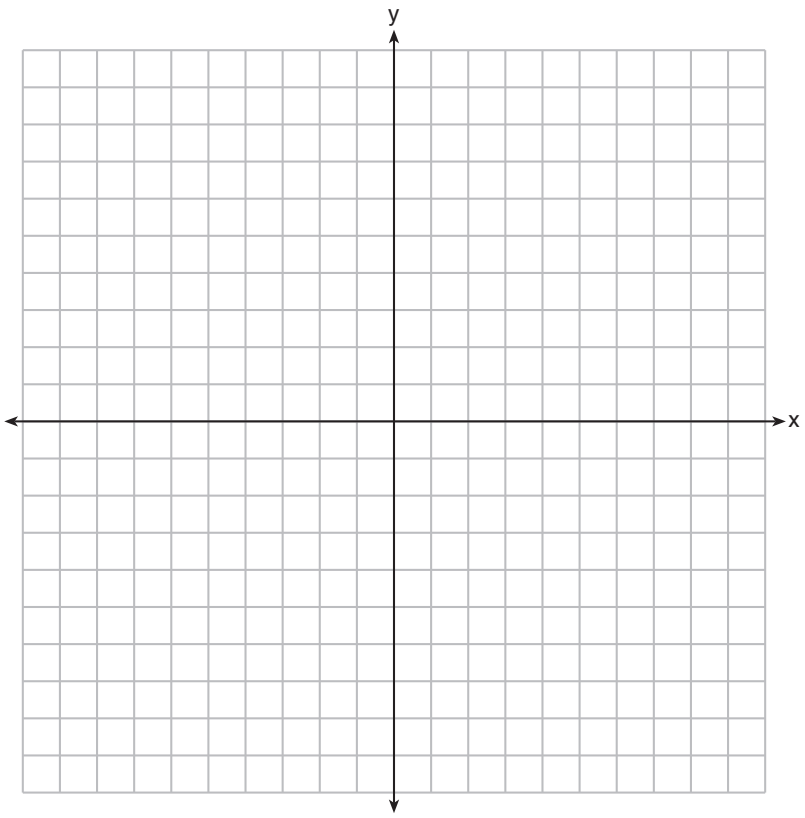


15. Is the expression $2 - \sqrt{5}$ rational, irrational, or neither? Explain.

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

$$x + y = 7$$

$$y = 3x + 3$$



Solve each system algebraically.

17. $2x - 4y = 14$
$5x + 4y = 7$

18. $2x - y = -7$
$3x + 4y = 17$

19. 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?

20. 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?

21. 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?