BECA / Dr. Huson / Algebra 2
11 January 2018
Test: Exponents and exponential functions Name:

Simplify expressions

Simplify by collecting like terms.

1. $-2x^2 + 4x - 19 + 12x^2 - 4x + 9$

2. $-2(a^2 - 3a + 6) - 3(a^2 - 2a - 4)$

Solve equations

Solve for the value of x.

3. $16 = -x - 3x$

4. $\frac{1}{3}(30 - 27x) = x$

5. $10 = \frac{1}{4}x + 2.75x - 8$

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Slope-intercept form

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

6. $y = \frac{1}{3}x - 4.2$

7. $x + 2y = 6$

Parallel and perpendicular linear equations

8. What is the equation of the line with a slope of 2 passing through the point $(0, -5)$?

9. What is the equation of a line parallel to $y = -2x + 6$ with a y-intercept of 3?

10. What is the slope of a line perpendicular to the line $3x + 12y = 11$?

Function substitution

11. Given $f(x) = 4x - 13$. Simplify $f(\frac{3}{2})$.

12. Given $f(x) = \dfrac{(11 - x)}{5x}$. Simplify $f(-1)$.

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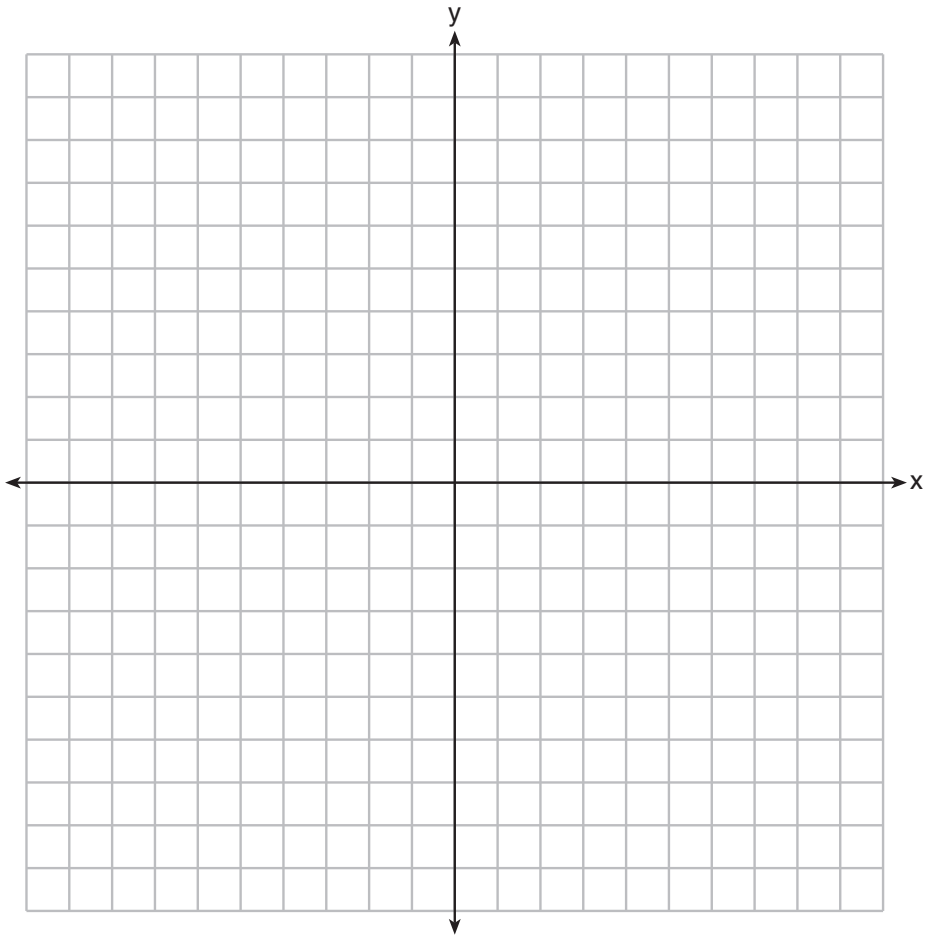
Graphing linear functions

Use pencil for graphs. 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) Mark and label the point $Q(4, -2)$ on the graph.
    (e) A second line, $g(x)$, is parallel to $f(x)$ and passes through point Q. Plot $g(x)$ on the graph.
    (f) What is the y-intercept of $g(x)$?



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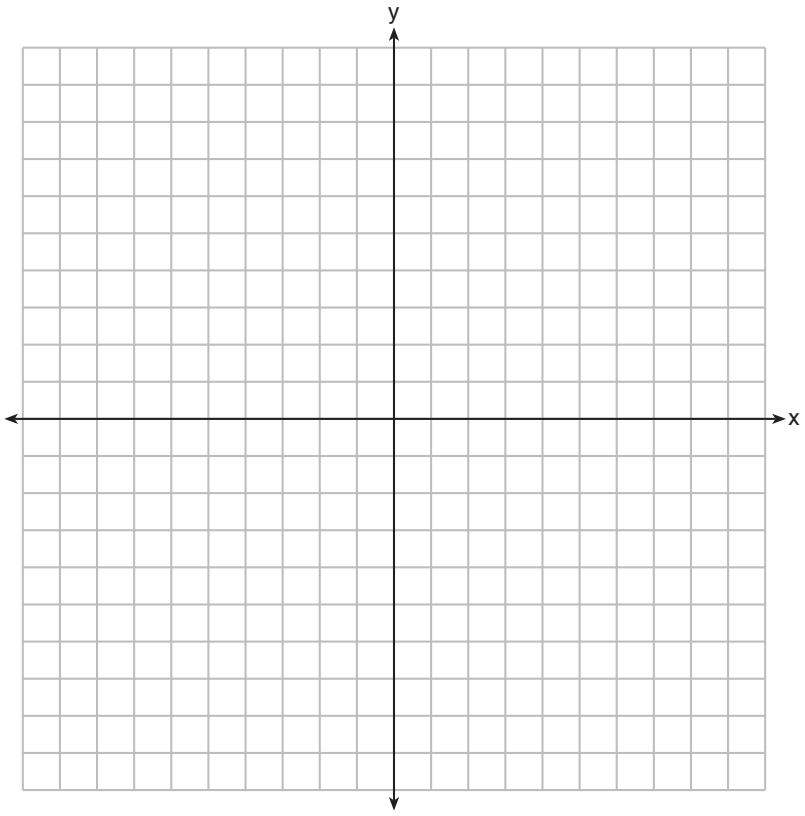
14. (a) On the axes below, for $-3 \leq x \leq 5$, graph $f(x) = 2^{x-1} - 8$

(b) What is the y-intercept of the function?

(c) The function f has an asymptote. Draw the asymptote.

(d) What is the equation of the asymptote?

(e) On the graph, mark and label the point $P(2, f(2))$.



15. Explain why the radical $\sqrt[3]{49}$ is equivalent to $7^{\frac{2}{3}}$, an expression with a rational exponent.

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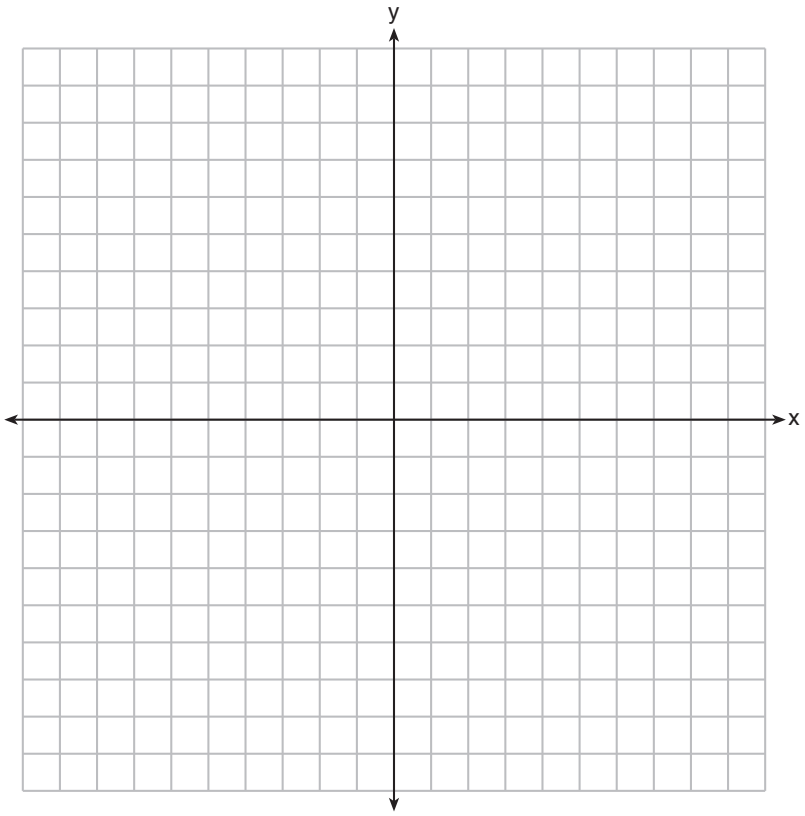
16. Solve the system of equations by graphing. Select a point in the solution set and label it on the graph as ordered pair.

$$x + y \geq 5$$
$$-2x + y > -4$$



Solve the system algebraically.

17. $-x + 4y = -6$
$5x - 18y = 28$

18. $y = log_5 25$
$y = 3^x - 7$

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19. Oceanside Bike Rental Shop charges a 11.50 dollar bike fee plus 3.25 dollars an hour for renting a bike. Jeffrey paid 21.25 dollars total. How many hours did he pay to have the bike checked out? (write an equation first, then solve it)

20. Seth's parents gave him $5000 to invest for his 16th birthday. He is considering two investment options. Option A will pay him 4.5% interest compounded annually. Option B will pay him 4.6% compounded quarterly.

    (a) Write a function of option A and option B that calculates the value of each account after n years.

    (b) Seth plans to use the money after he graduates from college in 5 years. Determine how much money option A will earn, to the nearest cent.