ALBERT

Name _____ Date _____

Writing Equations in Two Variables Worksheet

Algebra 1 · Common Core HSA-CED.A.2

> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

Practice

Builds the skill step by step.

1. A plumber charges 50 dollars for a visit plus 40 dollars per hour of work. Write an equation for the total cost c, in dollars, for a job that takes h hours.

2. Use $c = 40h + 50$. What is the cost of a 3-hour job?

3. A pool holds 500 gallons and drains at 25 gallons per minute. Which equation gives the gallons g left after m minutes?

   A. $g = 25m - 500$

   B. $g = 500 + 25m$

   C. $g = 25 - 500m$

   D. $g = 500 - 25m$

4. Adult tickets cost 12 dollars and child tickets cost 8 dollars. Write an equation for the total t, in dollars, for a adult tickets and k child tickets.

5. Popcorn costs 5 dollars and a drink costs 3 dollars. A family spends exactly 30 dollars on p popcorns and d drinks. Which equation models this?

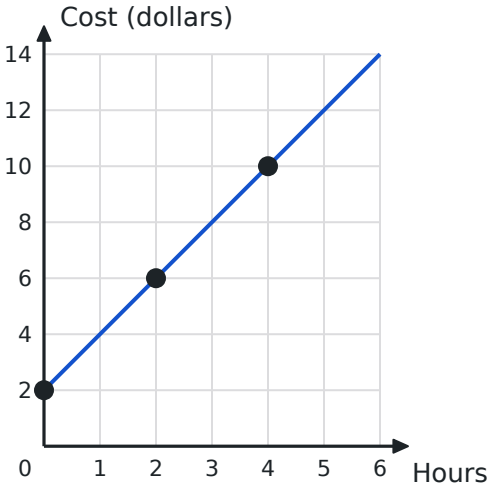
   A. $3p + 5d = 30$

   B. $5p + 3d \leq 30$

   C. $5p + 3d = 30$

   D. $p + d = 30$

6. The graph shows the cost of renting a kayak for x hours. Write an equation for the cost y.



7. You will graph $g = 500 - 25m$ for the draining pool, with minutes on the horizontal axis. Which label belongs on the vertical axis?

   A. Minutes

   B. Gallons of water left

   C. Size of the pool

   D. Gallons per minute

8. A car travels at a steady 55 miles per hour. Write an equation for the distance d, in miles, it travels in t hours.

9. On the graph of c = 40h + 50, with h on the horizontal axis, at what point does the line cross the vertical axis?

10. You will graph c = 40h + 50 for jobs from 0 to 8 hours. Which scale for the vertical axis fits best?

    A. 0 to 40, counting by 5

    B. 0 to 4,000, counting by 1,000

    C. 0 to 8, counting by 1

    D. 0 to 400, counting by 50

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On Level

Grade-level practice.

1. A phone's battery is at 80% and drops 5 percentage points for each hour of video. Write an equation for the battery level b after h hours of video.

2. Use $b = 80 - 5h$. After how many hours of video is the battery empty?

3. The table shows the cost c of renting a bike for h hours. Write an equation for c in terms of h.

Hours, h	Cost, c (dollars)
0	15
1	22
2	29
3	36

4. A rectangle has a perimeter of 40 cm. Write an equation for its length l in terms of its width w.

5. Soil costs 6 dollars a bag and mulch costs 4 dollars a bag. A gardener spends exactly 48 dollars, so $6s + 4m = 48$. Which point (s, m) is on the graph of this equation?

   A. $(6, 4)$

   B. $(4, 6)$

   C. $(2, 10)$

   D. $(8, 1)$

6. Use $6s + 4m = 48$. How many bags of soil can the gardener buy if no mulch is bought?

7. Write an equation for the area a of a square with side length s.

8. An investment of 1,000 dollars grows by 5% each year. Which equation gives its value v, in dollars, after t years?

   A. $v = 1.05(1000)^t$

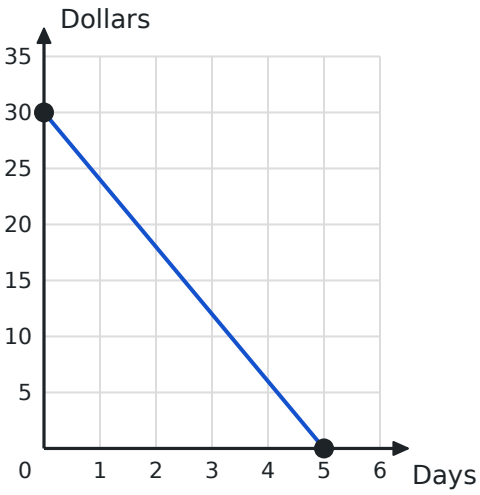
   B. $v = 1000(0.05)^t$

   C. $v = 1000(1.05)^t$

   D. $v = 1000 + 1.05t$

9. Use the equation from the last problem. What is the investment worth after 2 years?

10. Which situation matches the graph?



A. Ana has 5 dollars and saves 30 dollars each day.

B. Ana has 30 dollars and saves 6 dollars each day.

C. Ana has 30 dollars and spends 5 dollars each day.

D. Ana has 30 dollars and spends 6 dollars each day.

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Challenge

Multi-step and word problems that stretch it.

1. A plant grows at a steady rate. It is 4 cm tall on day 2 and 10 cm tall on day 5. Write an equation for its height h, in cm, on day d.

2. A taxi charges 3.50 dollars plus 2.25 dollars per mile. Write an equation for the cost c of a ride of m miles. Then find how many miles you can ride for exactly 26 dollars.

3. A box has a square base with side x inches and a height of 10 inches. Write an equation for its volume v in cubic inches.

4. A candle is 12 inches tall and burns down 1.5 inches per hour. Theo writes $h = 1.5t - 12$ for its height after t hours. What should the equation be?

   A. $h = 1.5t + 12$

   B. Theo's equation is already correct.

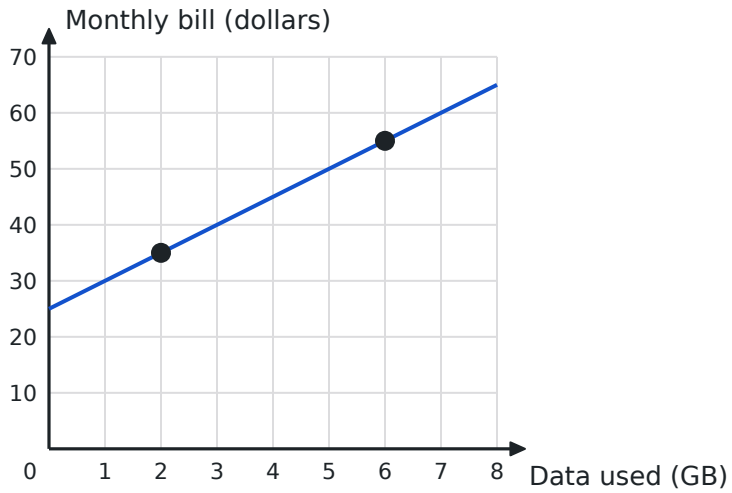
   C. $h = 12 - 1.5t$

   D. $h = 12t - 1.5$

5. Use the correct candle equation from the last problem. After how many hours has the candle burned all the way down?

6. A concert sells floor tickets for 40 dollars and balcony tickets for 25 dollars. Write an equation for the total money r, in dollars, from f floor tickets and b balcony tickets.

7. The graph shows a phone plan's monthly bill y, in dollars, when x GB of data are used. Write an equation for y in terms of x.



8. A culture starts with 40 bacteria and triples every hour. Which equation gives the number of bacteria n after t hours?

   A. $n = 40 + 3t$

   B. $n = 3(40)^t$

   C. $n = 40(3t)$

   D. $n = 40(3)^t$

9. A rectangle is 5 units longer than it is wide. Write an equation for its area a in terms of its width w.

10. You will graph $n = 40(3)^t$ for t from 0 to 5 hours. Which scale for the vertical axis fits best?

    A. 0 to 10,000, counting by 1,000

    B. 0 to 1,000, counting by 100

    C. 0 to 100, counting by 10

    D. 0 to 5, counting by 1