Linear Equations

Non-Calculator: Multiple Choice
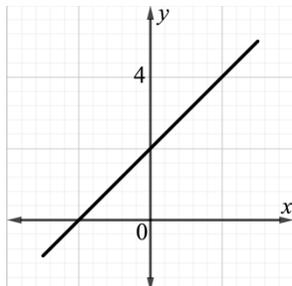
1. Which of the following is an equation of the line in the xy-plane above?
    A) $x = y$
    B) $x = -1 + y$
    C) $y = x + 2$
    D) $y = -x - 2$

2. Sherman purchases a coral reef tank for his bedroom. He puts 30 critters in the tank after setting it up and then begins to add critters at a rate of 2 per week. Which of the following represents the number of critters y in terms of x days?

    A) $y = 2x + 30$
    B) $y = 30x + 2$
    C) $y = \frac{2}{7}(x + 105)$
    D) $y = 30x - 2$

3. Milo opens a dog sanctuary. He needs to purchase dog kibble for all of the pooches. Milo likes to keep 3 pounds of kibble in reserve at all times, and the dogs collectively consume 1.5 pounds of kibble per week. Which of the following graphs below represents the number of pounds of kibbles (y) Max needs for x weeks?

A)

C)

B)

D)
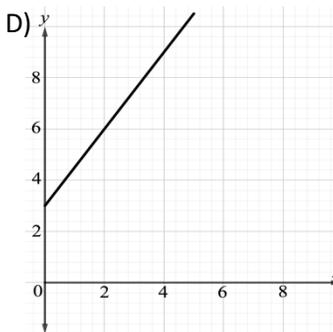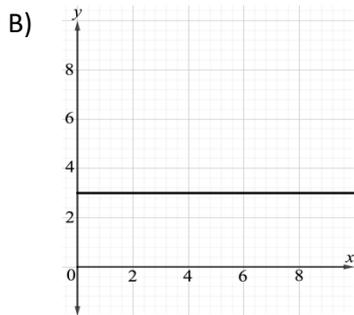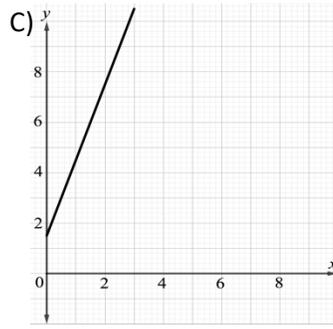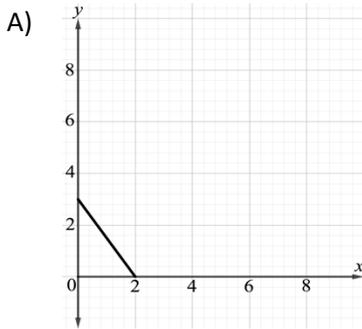
4. Referencing the situation described in question 3, in which week will Milo need to purchase more dog food?
   A) During week 1
   B) During week 2
   C) During week 3
   D) During week 4

5. Jolene sells her hand-thrown ceramic plates at the farmer's market. There is a $30 flat fee to rent a booth, and Jolene sells her pottery for $9 per plate. If x represents the number of plates sold, which of the following represents Jolene's profits at the end of the day?
   A) $9x + 30$
   B) $30x - 9$
   C) $9x - 30$
   D) $-30x - 9$

6. While visiting New York City, you decide to take a cab. The cab fare is a flat fee of $4.00 plus an additional fee of $1.80 per mile. How much does it cost to ride for 7.2 miles in the cab?
   A) $14.96
   B) $16.40
   C) $16.96
   D) $19.96

7. Gemma opens a lemonade stand. She takes out a $5.00 loan from her mom to pay for supplies and promises to pay her back at the end of the day. Gemma sells lemonade for $0.50 per cup. If x represents the number of cups sold, which of the following equations represents Gemma's lemonade profit, after she pays her mom back?
   A) $5x + 0.5$
   B) $0.5x + 5$
   C) $0.5x - 5$
   D) $5x - 0.5$

8. In the xy-plane, the graph of which of the following equations is perpendicular to the graph of the equation $-3x + 4y = 12$?
   A) $4x + 3y = 24$
   B) $-4x + 3y = 12$
   C) $-3x - 4y = 24$
   D) $3x + 4y = 12$

Non-Calculator: Grid In

9. Chiara rides a helicopter and is dropped off on a giant sand dune at 4,000 feet above sea level. Chiara begins trudging up the dune at 8:00PM at a rate of 1,200 feet per hour. She stops from 12:00PM to 12:30PM to eat lunch and continues hiking. What altitude will Chiara reach at 1:00PM?

10. Elijah is a seasoned scuba diver. On a dive in the Galapagos, Elijah spends some time filming hammerhead sharks and begins his ascent to the surface at 4:05PM. Elijah knows that divers should ascend at a rate of no more than 30 feet per minute and paces himself at 26 feet per minute to be safe. Elijah safely surfaces and rests on the boat for exactly 2 minutes before checking the time. When he looks at his watch, the time is 4:11PM. How many feet below the surface were the hammerheads swimming?

Calculator: Multiple Choice

11. In the xy-plane, the point $(8,4)$ lies on the graph of the line $y = kx + 2$, where k is a constant. What is the value of k?

A) $\frac{1}{4}$

B) $\frac{1}{8}$

C) 2

D) 4

12. In the xy-plane, the points $(x, 6)$ lies on the graph of the line $y - 12 = \frac{1}{2}(x - 10) + 2$. What is the value of x?
A) -8
B) -6
C) -4
D) 6

13. Hermione can brew potions at a rate of 8 potions every hour. She starts brewing potions at 4:00AM and stops from 6:00AM to 6:45AM to sip coffee and read a book. After that, she brews potions again from 6:45AM to 8:30AM. By 8:30AM, how many potions has Hermione brewed?
A) 22
B) 24
C) 26
D) 30

14. The Berkeley Community Supported Agriculture (CSA) would like to increase membership by a total number of n people per year. There were s people in the CSA at the beginning of this year. Which function best models the total number of people, y, the CSA plans to have as members x years from now?
   A) $y = nx - s$
   B) $y = nx + s$
   C) $y = s\,(n)^x$
   D) $y = n(s)^x$

Calculator: Grid In

15. Maria draws the line $4y - 2x = 8$ and draws another line that is perpendicular to that line. She then draws a third line that is perpendicular to the second line. What is the slope of the third line that Maria draws?