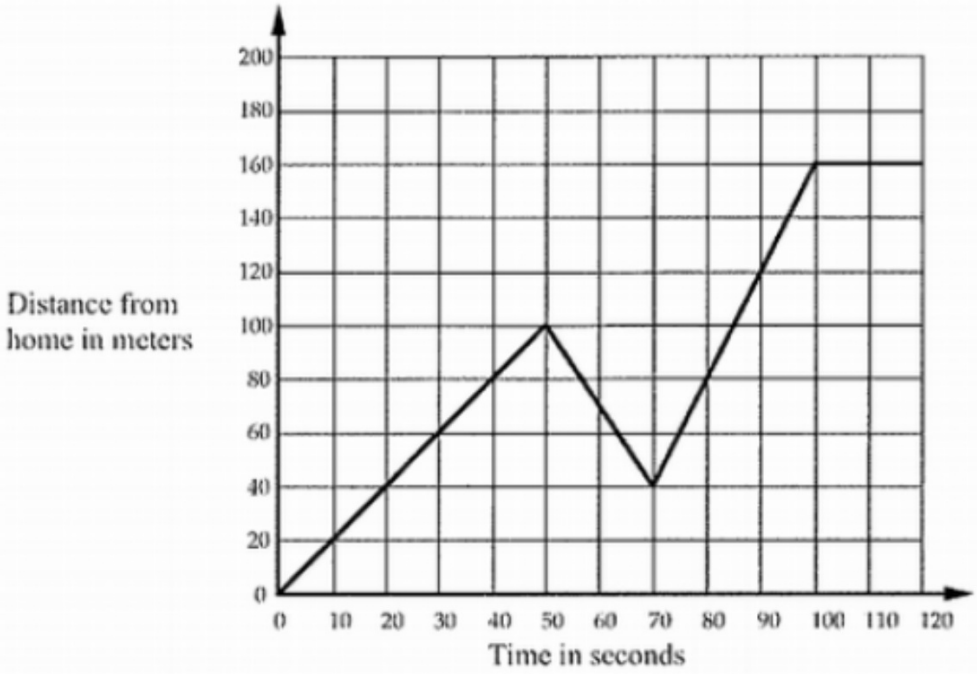
Every morning Tom walks along a straight road from his home to a bus stop, a distance of 160 mete
The graph shows his journey on one particular day.

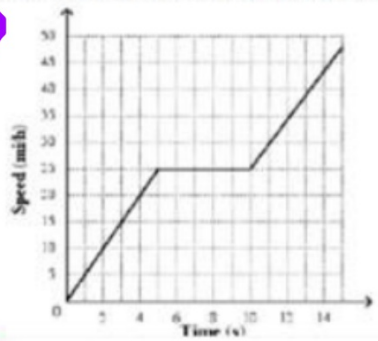



1. Describe what may have happened.
   You should include details like how fast he walked.

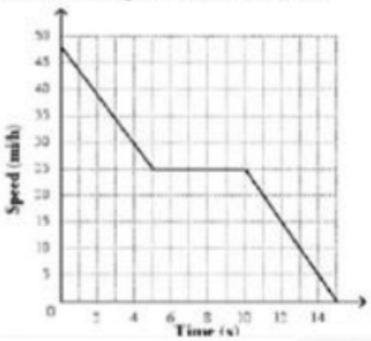
.....

A car traveling at 0 mi/h accelerates to 25 mi/h over the first 5 seconds. It maintains that speed for the next 5 seconds, and then accelerates to 48 mi/h during the next 5 seconds.

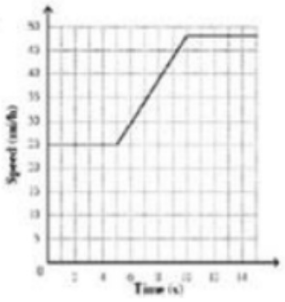
a.



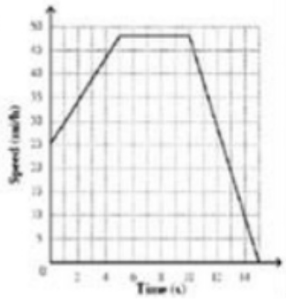

c.




b.

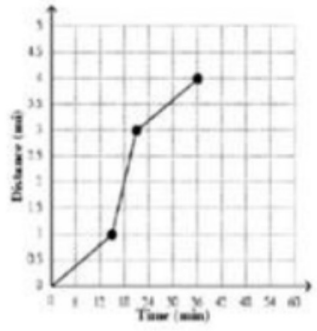



d.

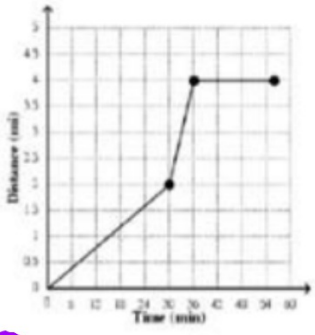


2. Select a graph for the situation. You wait for the express bus for 30 minutes, get on and ride the bus non-stop for 3 miles, and then walk another mile to your home.

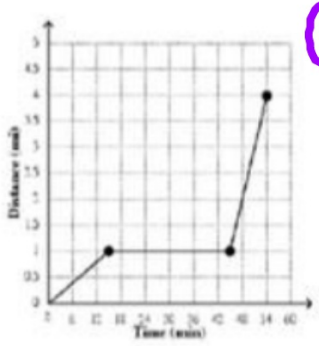
a.



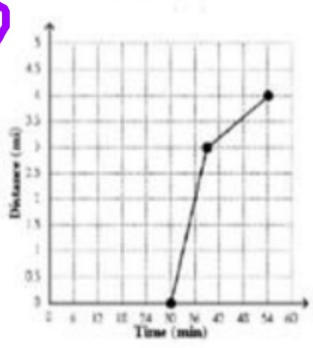

c.



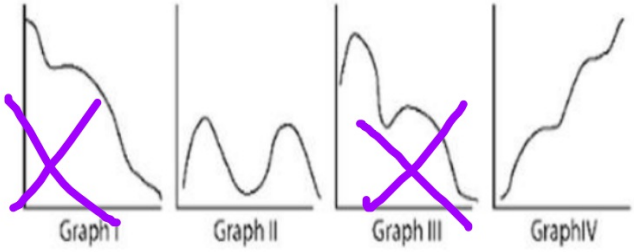

b.




d.

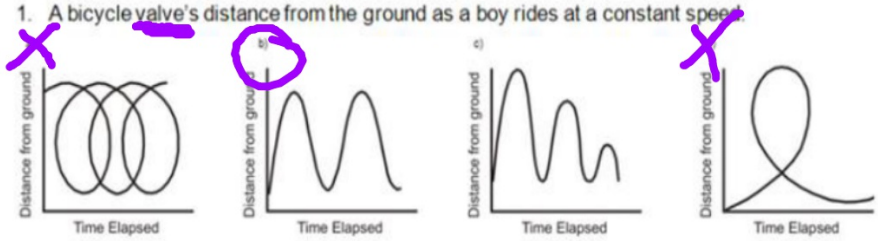



3. Which graph most likely describes the distance a person walks in a 24-hour period? Why?

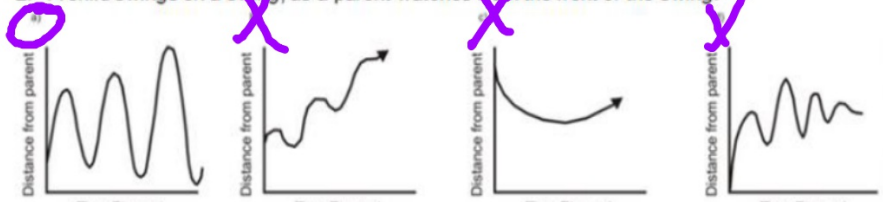



a. Graph II  b. Graph III  c. Graph IV  d. Graph I

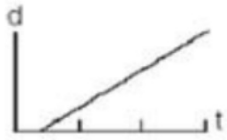
1. A bicycle valve's distance from the ground as a boy rides at a constant speed.



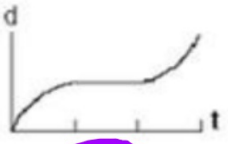

2. A child swings on a swing, as a parent watches from the front of the swing.



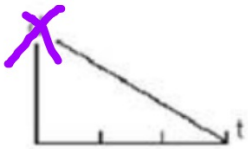
5)A bug travels up a tree, from the ground, over a 30-second interval. It travels fast at first and then slows down. It stops for 10 seconds, then proceeds slowly, speeding up as it goes. Which sketch best illustrates the bug's distance (*d*) from the ground over the 30-second interval (*t*)?



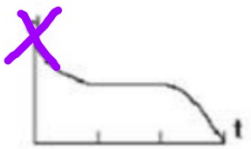

(1)




(3)



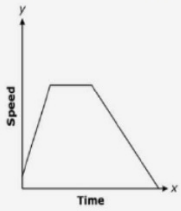

(2)




(4)

Story Graphs PRACTICE

1. Which scenario would *best* match the graph below?



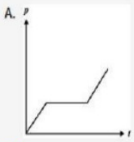

A. The speed of a skier riding to the top of a mountain and skiing down to the bottom.

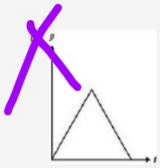
B. The speed of a child going up to the top of a slide, sitting there for a while, and sliding down the other side.

C. The speed of a driver entering the interstate highway, driving at a constant speed, and then exiting the interstate highway.

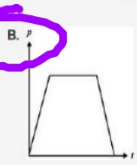
2. In the warm-up phase, the output production of a machine increased at a steady rate. It then began producing at a constant rate. When it neared production goal, it automatically decreased the production rate as it cooled off. Which graph best represents the relationship between the production ($p$) as a function of time ($t$)?

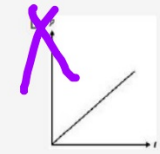
A.



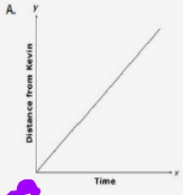

B.



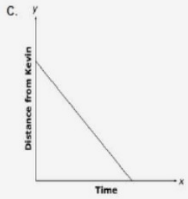




3. Kevin was playing fetch with his dog in a field. Kevin threw a stick. The dog ran to get the stick, paused, and then brought it back to Kevin. Which graph *best* represents the dog's distance from Kevin for this event?

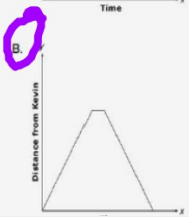
A.




C.

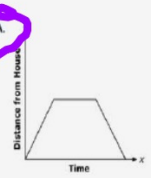



B.

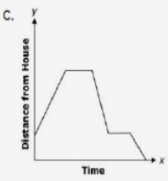



4. Emily went to the beach for the day. Leaving her house, Emily drove to the beach, stayed there for a few hours, then drove home. Which graph *best* represents this scenario?

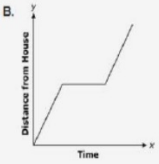
A.




C.

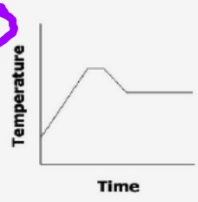



B.



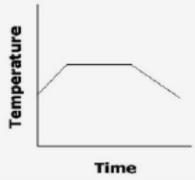
5. Joey is cooking pasta sauce for his spaghetti. He brings the sauce to a boil and continues to boil for 5 minutes. He then reduces the heat and cooks on low for 20 minutes before serving. Which graph *best* represents the cooking for his sauce?

A.




C.

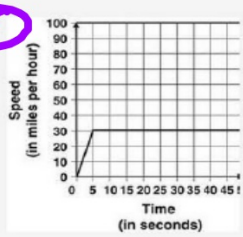

B.



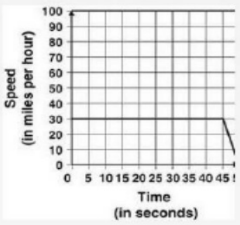

D.


6. A car accelerates from 0 to 30 miles per hour in 5 seconds with constant acceleration. The car continues to move at 30 miles per hour for the next 45 seconds. Which graph shows this relationship between speed and time?

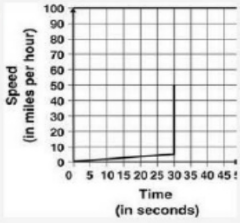
A



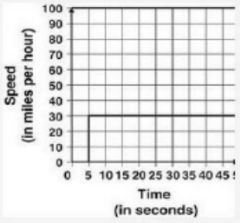

C




B




D



## Practice Functions Test

1. Which relation below is a function?

**A.**

| $x$ | $y$ |
|---|---|
| 0 | –2 |
| 1 | –3 |
| 0 | –4 |
| 2 | –5 |

**B.**

| $x$ | $y$ |
|---|---|
| 0 | 2 |
| 1 | 3 |
| 0 | 4 |
| 2 | 5 |

**C.**

| $x$ | $y$ |
|---|---|
| 0 | 0 |
| 1 | 1 |
| 0 | 8 |
| 2 | 27 |

**D.**

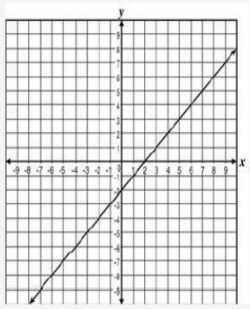
| $x$ | $y$ |
|---|---|
| 0 | 0 |
| 1 | –4 |
| 2 | 8 |
| 3 | 4 |

2. Which linear graph represents the values in the table below?

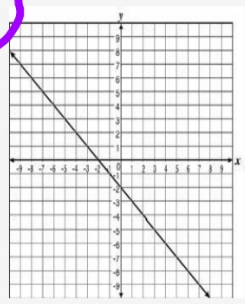
| $x$ | $y$ |
|---|---|
| −2 | 0 |
| 0 | −2 |
| 2 | −4 |

match

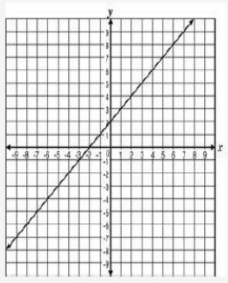
A.



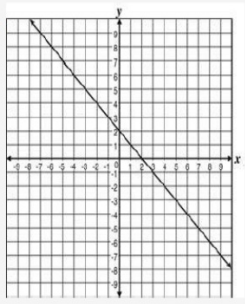
C.



B.



D.



3. Which chart represents a function?

A.

| x | y |
|---|---|
| 0 | 0 |
| 1 | −1 |
| 1 | 1 |
| 4 | 2 |

B.

| x | y |
|---|---|
| 2 | 6 |
| 4 | 10 |
| 6 | 14 |
| 8 | 18 |

C.

| x | y |
|---|---|
| −2 | 2 |
| 2 | −3 |
| 2 | 2 |
| 3 | −3 |

D.

| x | y |
|---|---|
| 3 | 2 |
| 3 | −2 |
| 5 | 24 |
| −5 | 24 |

4. In which table is $y$ *not* a function of $x$?

**A.**

| $x$ | $y$ |
|---|---|
| -1 | 4 |
| -2 | 7 |
| -3 | 12 |
| -4 | 19 |

**B.**

| $x$ | $y$ |
|---|---|
| -5 | 11 |
| -2 | 2 |
| 1 | -7 |
| 5 | 19 |

**C.**

| $x$ | $y$ |
|---|---|
| -1 | 1 |
| -1 | -1 |
| 0 | 0 |
| 4 | 2 |

**D.**

| $x$ | $y$ |
|---|---|
| -4 | 13 |
| -2 | 1 |
| 2 | 1 |
| 4 | 13 |

5. Which of the following equations represents a function?

A. $x = 2$

B. $y^2 = x + 2$

C. $y^2 = x^4 + 2$

D. $y = x^2$

6. Which of the following relations is not a function?

A. {(0, 1), (1, 1), (2, 1), (3, 1)}

B. {(0, 1), (0, 2), (0, 3), (0, 4)}

C. {(0, 0), (3, 4), (5, 6), (8, 9)}

D. {(0, 0), (2, 2), (4, 4), (6, 6)}

7. Ronny's Carpet Cleaning uses the equation $y = 15x + \$22.50$ to calculate the total cost, $y$, to clean carpet for $x$ number of hours. Juan's Carpet Cleaning uses the table below to calculate the total cost.

Juan's Carpet Cleaning

| Number of Hours ($x$) | Total Cost ($y$) |
|---|---|
| 1 | \$38.50 |
| 3 | \$65.50 |
| 6 | \$106.00 |
| 8 | \$133.00 |

Which company charges less per hour, and by how much?

A. Ronny's Carpet Cleaning charges \$2.50 less per hour.

B. Juan's Carpet Cleaning charges \$2.50 less per hour.

C. Ronny's Carpet Cleaning charges \$1.50 less per hour.

D.

8. The table and graph below represent two different functions.

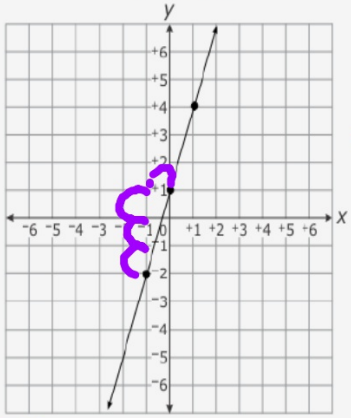
Function 1

| $x$ | $y$ |
|---|---|
| 3 | -12 |
| 1 | -2 |
| 0 | 3 |

-2 → +10
-1 → +5

$m = \frac{10}{-2} = -5$

Function 2




$\frac{\Delta y}{\Delta x} = \frac{3}{1}$

$m = 3$

What is the difference between the slopes of the two functions?

8?

A. 4 B. 3 C. 2

9. Jenna charges $25 to babysit one child and $5 for each additional child. Tyler's babysitting rates are shown in the table below.

$y = 5x + 25$

| Number of Children | Cost to Babysit |
|---|---|
| 2 | $36 |
| 3 | $42 |
| 4 | $48 |

How much more does Tyler charge to babysit one child than Jenna charges to babysit one child?

A. $4

B. $5

C. $6

10. Art classes at Studio A cost $15 per class, plus a one-time fee of $20. The following functions represent the total cost, $y$, of taking $x$ art classes at four other studios. Which function represents the studio with a cost per class greater than Studio A?

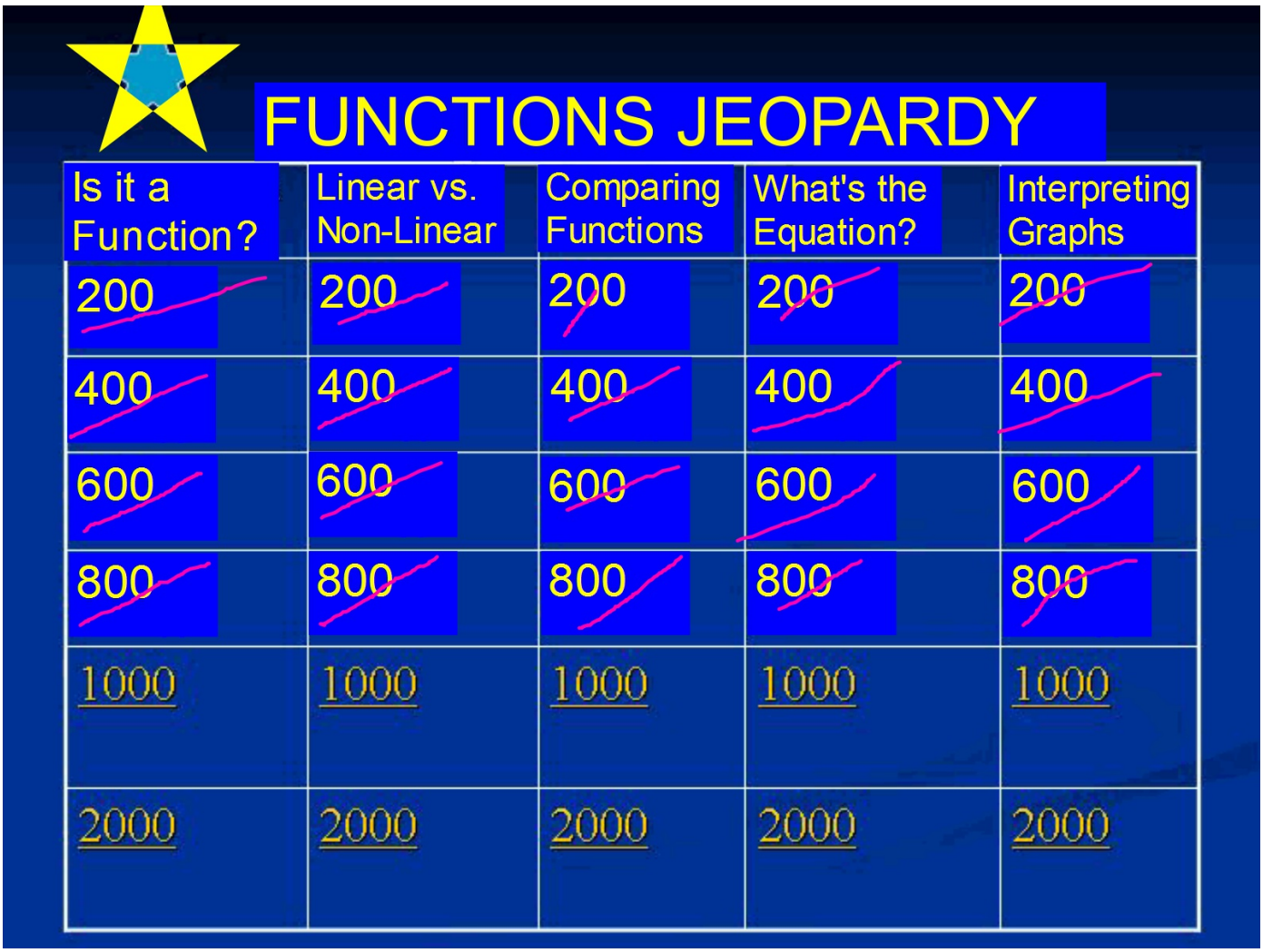
$y = 15x + 20$

**A.** $y = 12x + 25$

**B.** $y = 14x + 11$

**C.** $y = 15x + 14$

**D.** $y = 18x + 12$


FUNCTIONS JEOPARDY
Is it a Function?
Linear vs. Non-Linear
Comparing Functions
What's the Equation?
Interpreting Graphs
200
400
600
800
1000
2000

# Category 1
# 200

Which of the following relations is a function?

**A.** $\{(-1, -4), (-1, 0), (-1, 5), (-1, 7), (-1, 9)\}$

**B.** $\{(-2, -4), (-1, 7), (1, -1), (1, 1), (3, 9)\}$

**C.** $\{(-4, 9), (-3, 1), (-2, 3), (-2, 12), (0, 6)\}$

**D.** $\{(0, -4), (1, -4), (2, 4), (3, 4), (4, -4)\}$

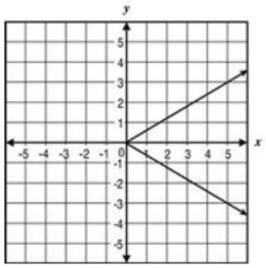
Category 1
200

D

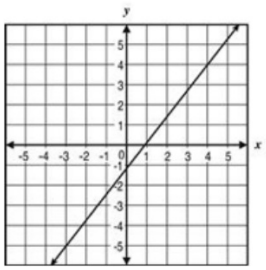
# Category 1
# 400

Which relation is a function?

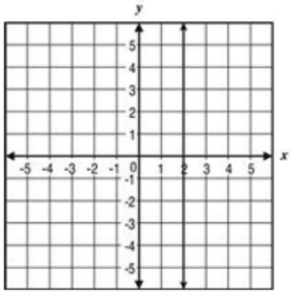
A.



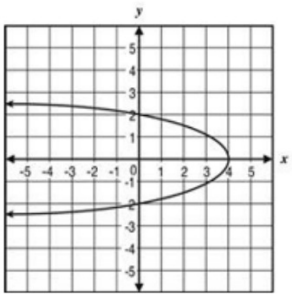
B.



C.



D.



Category 1
400

B

# Category 1
# 600

Which equation does *not* represent a function?

A. $y = x + 5$

B. $y = x^2 + 3$

C. $y^2 = x + 4$

# Category 1
# 600

C

# Category 1
# 800

Which of the equations shown below represents a function?

Equation 1 : $y = x^2 + 2x + 9$

Equation 2 : $x = 9 - y^2$

**A.** Only 1

**B.** Only 2

**C.** Both 1 and 2

**D.** Neither 1 nor 2

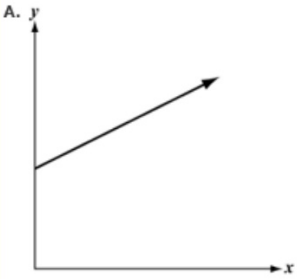
Category 1
800

A

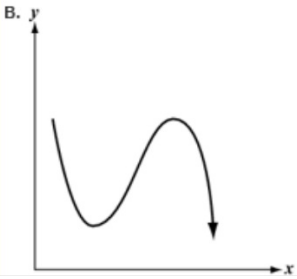
# Category 2
# 200

Which graph represents a linear function?

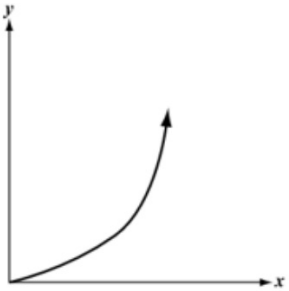
A.



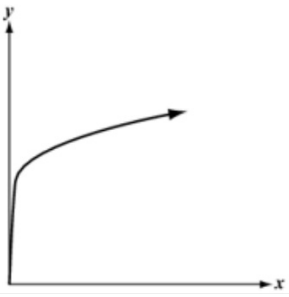

B.




C.




D.



# Category 2
# 200

**A**

# Category 2
# 400

Which numerical pattern is a linear progression?

**A.** $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \ldots$

**B.** 1, 3, 7, 13, . . .

**C.** −10, −20, −40, −80, . . .

**D.** 18, 26, 34, 42, . . .

Category 2
400

D

# Category 2
# 600

Which equation represents a linear function?

A. $y = \frac{1}{x}$

B. $y = 2x - 3$

C. $y = 5x^3 + 8$

D. $y = x^2 + 2x + 1$

Category 2
600

B

# Category 2
# 800

Which set of ordered pairs is linear?

A. $\{(-2, 3), (-1, 6), (0, 12)\}$

B. $\{(3, -1), (5, -3), (10, -10)\}$

C. $\{(-1, 0), (2, -3), (5, -6)\}$

# Category 2
# 800

**C**

# Category 3
# 200

The equation of function $J$ is $y = x - 1$. The table below shows some points of function $K$.

| $x$ | $y$ |
|---|---|
| 4 | 1 |
| 6 | 2 |
| 8 | 3 |

Which is true about the two functions?

**A.** The slope of function $J$ is greater than the slope of function $K$.

**B.** The $y$-intercept of function $J$ is greater than the $y$-intercept of function $K$.

**C.** The slopes of functions $J$ and $K$ are the same.

# Category 3
# 200

**A**

# Category 3
# 400

Function 1 and function 2 can be represented as shown below.

Function 1: $y = -3x + 2$

Function 2:

| $x$ | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| $y$ | 3 | 1 | −1 | −3 | −5 |

Which statement **correctly** compares the rates of change of functions 1 and 2?

**A.** The slope of function 1 is $-3$, and the slope of function 2 is $2$, so function 2 is changing at a faster rate.

**B.** The slope of function 1 is $2$, and the slope of function 2 is $3$, so function 2 is changing at a faster rate.

**C.** The slope of function 1 is $-3$, and the slope of function 2 is $-2$, so function 1 is changing at a faster rate.

**D.** The slope of function 1 is $-2$, and the slope of function 2 is $-3$, so function 1 is changing at a faster rate.

# Category 3
# 400

**C**

# Category 3
# 600

Pete's Plumbing charges a flat fee of $28 for a house call and inspection and an additional $35 per hour for any onsite work. Which table represents a cost function with a greater hourly rate than these charges?

A.

| Hours Worked | Total Charge (in dollars) |
|---|---|
| 3 | 109 |
| 5 | 163 |
| 7 | 217 |

B.

| Hours Worked | Total Charge (in dollars) |
|---|---|
| 3 | 136 |
| 5 | 208 |
| 7 | 280 |

C.

| Hours Worked | Total Charge (in dollars) |
|---|---|
| 6 | 174 |
| 9 | 261 |
| 12 | 348 |

D.

| Hours Worked | Total Charge (in dollars) |
|---|---|
| 6 | 209 |
| 9 | 296 |
| 12 | 383 |

# Category 3
# 600

**B**

# Category 3
# 800

Two different fitness centers charge a one-time membership fee, plus a monthly charge to use the facilities. Fitness center A charges a membership fee of $100, plus $45 per month. The table below shows the cost of fitness center B after a certain number of months of use.

Fitness Center B

| Months | Cost for Members |
|---|---|
| 1 | $117 |
| 3 | $221 |
| 5 | $325 |

What is the difference between the membership fees at the 2 fitness centers?

A. $17

B. $20

C. $35

D. $48

# Category 3
# 800

C

# Category 4
# 200

Which is an equation of the relation shown in the table below?

| $r$ | $s$ |
|---|---|
| -2 | 1 |
| -1 | 2 |
| 0 | 3 |
| 1 | 4 |
| 2 | 5 |

A. $r = 3s$

B. $r = s + 3$

C. $s = 3r$

D. $s = r + 3$

**Category 4**
**200**

**D**

# Category 4
# 400

Which equation represents the relationship between $x$ and $y$ in the table below?

| $x$ | $y$ |
|---|---|
| 0 | 1 |
| 2 | 2 |
| 4 | 3 |
| 6 | 4 |

A. $y = x + 1$

B. $y = \frac{1}{2}x + 1$

C. $y = x - 2$

D. $y = -\frac{1}{2}x + 1$

# Category 4
# 400

**B**

# Category 4
# 600

A phone company offers a mobile phone plan for a monthly fee of \$19.95 plus \$0.05 for each minute used during the month. Which equation below best represents the cost, $y$, for one month when $x$ minutes are used?

A. $y = 0.05x$

B. $y = 0.05x + 19.95$

C. $y = 19.95x$

D. $y = 19.95x + 0.05$

# Category 4
# 600

**B**

# Category 4
# 800

Which is an equation of the line that goes through the points $(-2, -2)$ and $(1, 7)$?

A. $y = 3x - 8$

B. $y = 3x + 4$

C. $y = \frac{1}{3}x - 8$

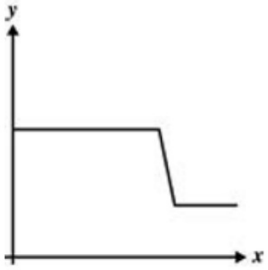
D. $y = \frac{1}{3}x + 4$

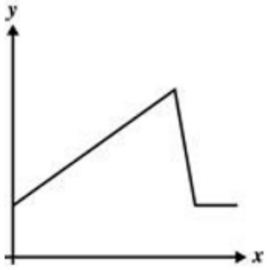
Category 4
800

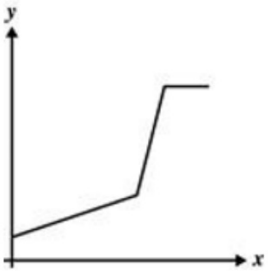
B

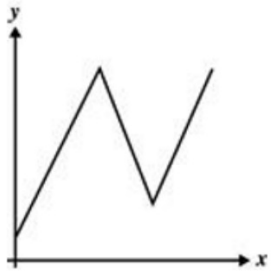
# Category 5
# 200

The value of a sculpture steadily increased for several years and then dropped sharply. It then continued to remain at its lowest value. Which graph best represents the value of the sculpture over these years?

A. 


B. 


C. 

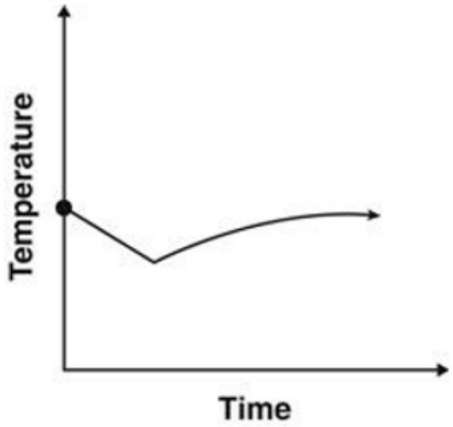

D. 

Category 5
200

B

# Category 5
# 400

Which situation is best illustrated in the graph?




**A.** Timmy puts his drink in the refrigerator, removes it, and places it in the freezer.

**B.** Tonya puts her drink in the microwave, heats it, and then drinks it very slowly.

**C.** Lindsey sets her drink on the table and it warms to room temperature.

**D.** Michael puts ice in his drink and then drinks it very slowly.

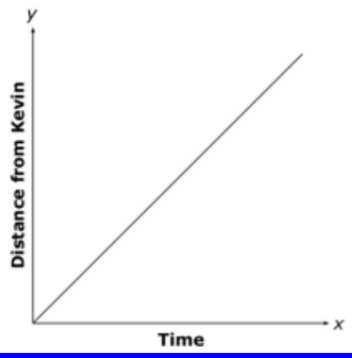
# Category 5
# 400

**D**

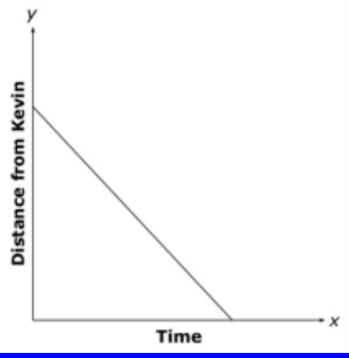
# Category 5
# 600

Kevin was playing fetch with his dog in a field. Kevin threw a stick. The dog ran to get the stick, paused, and then brought it back to Kevin. Which graph *best* represents the dog's distance from Kevin for this event?

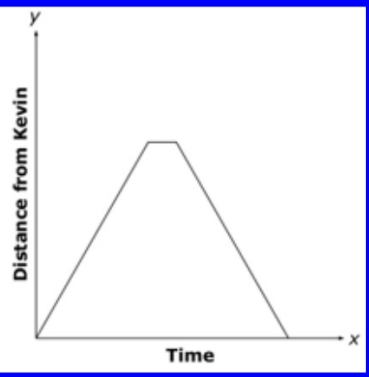
A.




C.




B.



Category 5
600

B

# Category 5
# 800

At the beginning of each month, Patrick restocked his store to make sure he had a total of 25 backpacks available for sale. The graph below shows the number of backpacks he had not sold each month.


Which statement best describes the horizontal segment of the graph in Months 7 through 12?

**A.** The rate of sales was 25 backpacks per month.

**B.** The rate of backpacks not sold was 25 per month.

**C.** There was an increase of 5 backpacks sold per month.

**D.** There was an increase of 5 backpacks not sold per month.

# Category 5
# 800

**B**