



MATHS

BOOKS - KAPLAN INC MATHS

(ENGLISH)

FUNCTIONS

How Much Do You Know

1. $p(x) = 7x + 4$

$s(x) = 7 - p(x)$

What is the value of $s(-1)$?

A. -3

B. 4

C. 10

D. 17

Answer: C



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2. A function is defined by the equation $f(x) = \frac{x^2}{4} - 11$. For this function, which of the following domain values corresponds to a range value of 14 ?

A. -4

B. 10

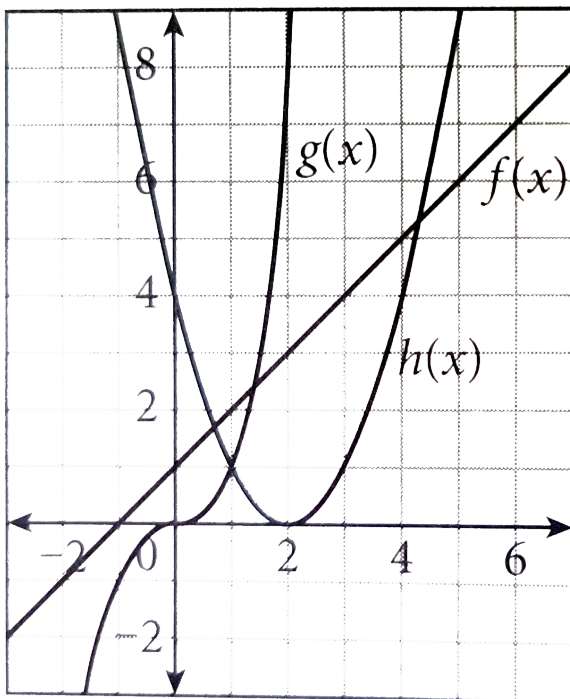
C. 38

D. 100

Answer: B



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3.

In the figure above, what is the value of $h(0) - 3(g(1) - f(2))$?

A. -2

B. 5

C. 10

D. 12

Answer: C



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4.

x	2	3	4	5
$f(x)$	7	13	19	25

Some values of the function f are shown in the table above. Which of the following defines f ?

A. $f(x) = 7x - 1$

B. $f(x) = 6x - 5$

C. $f(x) = 5x + 1$

D. $f(x) = 4x + 5$

Answer: B



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5. Briana is writing a 60-paper for a law school class. She estimates that she will average 45 words per minute while typing. If one page

contains approximately 50 words, which of the following correctly estimates the number of pages, p , remaining as a function of the number of minutes, m , that Briana types ?

$$\text{A. } p(m) = 60 - \frac{9m}{100}$$

$$\text{B. } p(m) = \frac{60 - 100}{9m}$$

$$\text{C. } p(m) = 60 - \frac{100}{9m}$$

$$\text{D. } p(m) = \frac{60 - 9m}{100}$$

Answer: A



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Try On Your Own

1. If $f(x) = 2x^2 + 7x - 3$, what is the value of $g(-2)$?

A. -25

B. -9

C. -1

D. 3

Answer: A



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2. If $k(x) = 5x + 2$, what is the value of $k(4) - k(1)$?

A. 15

B. 17

C. 19

D. 21

Answer: A



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x	$g(x)$
-6	-3
-3	-2
0	-1
3	0
6	1

x	$h(x)$
0	6
1	-4
2	2
3	0
4	-2

3.

Several values for the functions $g(x)$ and $h(x)$ are shown in the table above. What is the value of $g(h(3))$?

A. -1

B. 0

C. 3

D. 6

Answer: A



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4. If $p(x) = x^2 - 4x + 8$ and $q(9x) = x - 3$,

what is the value of $\frac{q(p(5))}{p(q(5))}$?

A. 0

B. 0.4

C. 1

D. 2.5

Answer: D



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5. 

The table shows some values of the linear functions f and g . If

$h(n) = 2 \times f(n) - g(n)$, what is the value of

$h(6)$?

A. 21.3

B. 35.0

C. 41.1

D. 42.1

Answer: D



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6. 

The above figure shown the function $p(x) = |x|$. Which statemetn about the function is NOT true ?

A. $p(0) = 0$

B. $p(-4) = 4$

C. $p(4) = -4$

D. The domain of $p(x)$ is all real numbers.

Answer: C



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7. 

The graph of $f(x)$ is shown above. Which of the following represents the domain and range of the function ?

A. Domain: $f(x) \geq 4$, range: all real numbers

B. Domain: $f(x) \leq 4$, range: all real numbers

C. Domain: all real numbers, range: $f(x) \geq 4$

D. Domain all real numbers, range: $f(x) \leq 4$

Answer: D



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8. 

Based on the above graph, if the coordinates of the maximum of $f(x)$ are (a,b) and the coordinates of the minimum of $f(x)$ are (c,d) what is the value of $a + b + c + d$?



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9. The graph of the linear function f has intercepts at $(c,0)$ and $(0,d)$ in the xy -plane. If $2c = d$ and $d \neq 0$, which of the following is true about the slope of the graph of f ?

A. It is positive.

B. It is negative.

C. It equals zero.

D. It is underfined.

Answer: B



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10. 

The complete graph of the function f is shown in the figure above. Which of the following is

equal to -1 ?

I. $f(-4)$

II. $f(0)$

III. $f(3)$

A. I and II

B. II only

C. I, II and III

D. III only

Answer: D



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11. 

Paulo is one of five contest finalists in the running for a year's worth of collage book expenses. The winner is the finalist with the highest number of votes on the contest host's website. Paulo recorded his vote total each day of the contest, data for five days are in the table above. Which of the following represents Paulo's vote count, v , as a function of time, f in days ?

A. $v(t) = 2t^2 + 3$

$$\text{B. } v(t) = \frac{t^2}{2} + 3$$

$$\text{C. } v(t) = 2t^2 + 2t$$

$$\text{D. } v(t) = \frac{t^2}{2} + 21$$

Answer: A



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12. 

The graph above shows a compact car's fuel economy as a function of speed. Which of the following is true ?

A. The rate of increase in fuel economy below 50 miles per hour is greater than the rate of decrease in fuel economy above 50 miles per hour.

B. The rate of increase in fuel economy below 50 miles per hour is equal to the rate of decrease in fuel economy above 50 miles per hour.

C. The rate of increase in fuel economy below 50 miles per hour is less than the

rate of decrease in fuel economy above 50 miles per hour.

D. Fuel economy peaks at 50 miles per hour, but nothing can be said about the rates of change in fuel economy above and below 50 miles per hour.

Answer: C



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13. 

The graph above Carmel's distance from home over a one-hour period, during which time she first went to the library, then went to the grocery store, and then returned home. Which of the following statements must be true ?

A. The grocery store is about 5 miles from Carmel's house.

B. Carmel traveled a total of 7 miles from the time she left home until she

returned.

C. The grocery store is 7 miles farther from Carmel's house than the library is.

D. Carmel spent 10 minutes at the library and 15 minutes at the grocery store.

Answer: D



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14. 

The entrance gates at a museum allow a constant number of visitors to enter every 15 minutes. A supervisor records the cumulative number of visitors for the day at various times as shown in the table above. The museum does not admit any visitors after 4:45 pm. What is the projected total number of visitors are granted entrance each 15-minute period throughout the day ?

A. 810

B. 895

C. 930

D. 960

Answer: C



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15. An environmental agency is working to reduce the amount of plastic that a community discards in the ocean. Currently, the community discards 6.2 million pounds of

plastic annually, and the agency's goal is to eliminate that amount by collecting and recycling the plastic. If the agency increases its collection and recycling capacity at a constant rate, and meets its goal at the end of the eight year, which of the following linear functions, f , could the agency use to model the amount of plastic being added to the ocean t years into the program ?

A. $f(t) = -\frac{62}{40}t + 6.2$

B. $f(t) = -\frac{31}{40}t + 6.2$

C. $f(t) = \frac{31}{40}t + 6.2$

$$D. f(t) = \frac{62}{40}t + 6.2$$

Answer: B



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16. 

Based on the figure above, what is the value of $f(-2) + g(2)$?

A. -3

B. 0

C. 3

D. 6

Answer: C



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17. A company uses the function $P(x) = 150x - x^2$ to determine how much profit the company will make when it sells 150 units of a certain product that sells for x dollars per unit. How much more profit per

unit, in dollars, will the company make if it charges \$25 for the product than if it charges \$20 ? (Ignore the dollar sign when gridding your response.)



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18. The customer service department of a wireless cellular provider has found that on Wednesdays, the polynomial function $C(t) = -0.0815t^4 + t^3 + 12t$ approximates the number of calls received by any given time,

where t represents the number of hours that have passed during the workday. Based on this function, how many calls can be expected by the end of one 10-hour workday ?



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19. A biologist is studying the effect of pollution on the reproduction of a specific plant. She uses the function $n(p)$ to represent these effects, where p is the number of seeds germinated by the test group of the plant over

a given period of time. Which of the following lists could represent a portion of the domain for the biologist's function ?

A.

$$\{\dots - 150, - 100, - 50, 0, 50, 100, 150\dots\}$$

B. $\{- 150, - 100, - 50, 0, 50, 100, 150\}$

C. $\{0, 0.25, 0.5, 0.75, 1, 1.25, 1.5\dots\}$

D. $\{0, 20, 40, 60, 80\dots\}$

Answer: D



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20. If $f(x) = 3 - x$ and $g(x) = \frac{x^2}{2}$, which of the following is NOT in the range of $f(g(x))$?

A. -3

B. 0

C. 2

D. 4

Answer: D



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21. The function g is defined above. What is the value of $g(-4x)$?

A. 7

B. $-12x - 5$

C. $12x - 5$

D. $12x^2 - 20x$

Answer: C



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$$22. r(x) = 3x - 7$$

$$t(x) = 3x + r(x)$$

The function r and t are defined above. What is the value of $t(2)$?

A. -3

B. -1

C. 0

D. 5

Answer: D



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23. $f(x) = ax^2 + 3x + 5$

The function f is defined above, and $f(3) = -4$. If a is a constant, what is the value of $f(2)$?

A. -2

B. 3

C. 5

D. 19

Answer: B



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24. A function a satisfies $a(-2) = 3$ and $a(3) = 8$. A function b satisfies $b(3) = 4$ and $b(7) = -2$. What is the value of $a(b(7))$?



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25. 

The function f , shown in the graph above, is

defined for $-7 \leq x \leq 7$. For which of the following values of x does $f(x) = 4$?

I. -4

II. -3

III. 5

A. III only

B. I and II only

C. II and III only

D. I, II, and III

Answer: C



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Function Notation

$$1. h(x) = \frac{2x + 7}{x - 4}$$

Which of the following must be true about $h(x)$?

I. $h(14) = 3.5$

II. The domain of $h(x)$ is all real numbers

III. $h(x)$ may be positive or negative

A. I and II only

B. I and III only

C. II and III only

D. I, II, and III

Answer: B



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Graphs Of Functions

1. 

The maximum value of function g , whose graph

is shown above, is m . Values for the function h are shown in the table. What is the value of $h(m)$?

A. -3

B. -2

C. 2

D. 4

Answer: B



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Describing Real Life Situations With Functions

1. 

A certain cookie company sells several varieties of chocolate cookies, each with an additional ingredient. The company sells the different varieties in differently sized boxes. The number of cookies per box and the profit per box for the different varieties is shown in the table above. The relationship between the number of cookies per box and the profit, in dollars, that the company makes per box can be

represented by a linear function. Which of the following functions correctly represents the relationship ?

A. $p(n) = 0.11n - 0.25$

B. $p(n) = 0.1n - 0.35$

C. $p(n) = 0.09n - 0.95$

D. $p(n) = 0.8n - 0.5$

Answer: D



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