MATHS

BOOKS - INDEPENDENTLY PUBLISHED MATHS (ENGLISH)

FUNCTIONS

Examples

1. If $f(x) = 3x - 2$ and $g(x) = x^2 - 4$, write an expresion for each of the following functions:

(f+g)(x)

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2. If $f(x) = 3x - 2$ and $g(x) = x^2 - 4$, write an expresion for each of the following functions:

(f-g)(x)

3. If $f(x) = 3x - 2$ and $g(x) = x^2 - 4$, write an expresion for each of the following functions:

$(f \cdot g)(x)$

4. If $f(x) = 3x - 2$ and $g(x) = x^2 - 4$, write an expresion for each of the following functions:

$$\left(\frac{f}{g}\right)(x)$$

5. If $f(x) = 3x - 2$ and $g(x) = x^2 - 4$, write an expresion for each of the following functions:

$$(f \circ g)(x)$$

6. If $f(x) = 3x - 2$ and $g(x) = x^2 - 4$, write an expresion for each of the following functions:

$(g \circ f)(x)$

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7. Given $f(x) = 3x + 2$. Find $f^{-1}(x)$

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8. $f(x) = 3x + 2$. Is $g(x) = \dfrac{x - 2}{3}$ the inverse of f?

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9. $f(x) = x^2$. Find f^{-1}.

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10. Find the inverse of $f = \{(1, 2), (2, 3), (3, 2)\}$

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11. Kind the range of the function $f(x) = \dfrac{1}{x + 4} - 2$.

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12. $f(x) = x^3$ and $f(-x) = (-x)^3 = -x^3$.

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13. $f(x) = \dfrac{1}{x}$ and $f(-x) = \dfrac{1}{-x}$.

14. $f(x) = \sin x$ is odd because $\sin(-x) = -\sin x$.

15. The function f is defined by

$$f(x) = \begin{cases} x + 3 & \text{if} \quad x < 1 \\ x^2 & \text{if} \quad x \geq 1 \end{cases}.$$

Find $f(-5), f(1),$ and $f(3)$.

16. A store that makes copies charges 25 cents per copy per page if 50 or fewer copies of each page are made, 20 cents per copy if between 51 and 200 copies of each page are made, and 15 cents per copy if more than 200 copies of each page are made. How would this be written as a piecewise function?

Exercises

1. If {(3,2),(4,2),(3,1),(7,1),(2,3)} is to be a function, which one of the following must be removed from the set?

A. (3,2)

B. (4,2)

C. (2,3)

D. (7,1)

Answer: A

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2. For

$f(x) = 3x^2 + 4, \ g(x) = 2, \ \text{and} \ h = \{(1, 1), (2, 1), (3, 2)\}$

A. f is the only function

B. h is the only function

C. f and g are the only functions

D. f, g, and h are all functions

Answer: D

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3. What value(s) must be excluded from the domain of $f(x) = \dfrac{x + 2}{x - 2}$?

A. -2

B. 0

C. 2

D. 2 and -2

Answer: C

4. If $f(x) = 3x^2 - 2x + 4, f(-2) =$

A. -12

B. -4

C. -2

D. 20

Answer: D

5. If $f(x) = 4x - 5$ and $g(x) = 3^x$, then $f(g(2))=$

A. 3

B. 9

C. 27

D. 31

Answer: D

6. If $f(g(x)) = 4x^2 - 8x$ and $f(x) = x^2 - 4$, then

g(x)=

A. $4 - x$

B. x

C. $2x - 2$

D. 4x

Answer: C

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7. What value must be excluded from the domain of $\left(\dfrac{f}{g}\right)(x)$ if $f(x) = 3x^2 - 4x + 1$ and $g(x) = 3x^2 - 3$?

A. 0

B. 1

C. 3

D. both ± 1

Answer: D

8. If $g(x) = 3x + 2$ and $g(f(x)) = x$, then f(2)=

A. 0

B. 1

C. 2

D. 8

Answer: A

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9. If $p(x) = 4x - 6$ and $p(a) = 0$, then a=

A. -6

B. $-\dfrac{3}{2}$

C. $\dfrac{3}{2}$

D. $\dfrac{2}{3}$

Answer: C

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10. if $f(x) = e^x$ and $g(x) = \sin x$, then the value of $(f \circ g)(\sqrt{2})$ is

A. -0.01

B. -0.8

C. 0.34

D. 2.7

Answer: D

11. If $f(x) = 2x - 3$, the inverse of f, f^{-1} could be represented by

A. $f^{-1}(x) = 3x - 2$

B. $f^{-1}(x) = \dfrac{1}{2x - 3}$

C. $f^{-1}(x) = \dfrac{x - 2}{3}$

D. $f^{-1}(x) = \dfrac{x + 3}{2}$

Answer: D

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12. If $f(x) = x$, the inverse of f, f^{-1}, could be represented by

A. $f^{-1}(x) = x$

B. $f^{-1}(x) = 1$

C. $f^{-1}(x) = \dfrac{1}{x}$

D. $f^{-1}(x) = y$

Answer: A

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13. The inverse of

$f = \{(1, 2), (2, 3), (3, 4), (4, 1), (5, 2)\}$ would be a

function if the domain of f is limited to

A. {1,3,5}

B. {1,2,3,4}

C. {1,5}

D. {1,2,4,5}

Answer: B

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14. Which of the following could represent the equation of the inverse of the graph in the figure?

A. $y = -2x + 1$

B. $y = 2x + 1$

C. $y = \dfrac{1}{2}x + 1$

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

Answer: D

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15. Which of the following relations are even?

I. y=2

II. $f(x) = x$

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

  A. Only I

  B. Only I and II

C. Only II and III

D. only I and III

Answer: D

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16. Which of the following relations are odd?

I. y=2

II. $y = x$

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

A. only II

B. only I and III

C. only II and III

D. I,II and III

Answer: C

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17. Which of the following relations are both odd and even?

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

II. $x^2 - y^2 = 0$

III. $x + y = 0$

A. only III

B. only I and II

C. only I and III

D. only II and III

Answer: B

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18. Which of the following functions is neither odd nor even?

A. {(1,2),(4,7),(-1,2),(0,4),(-4,7)}

B. {(1,2),(4,7),(-1,-2),(0,0),(-4,-7)}

C. $y = x^3 - 1$

D. $y = x^2 - 1$

Answer: C

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