MATHS

BOOKS - INDEPENDENTLY PUBLISHED MATHS (ENGLISH)

PIECEWISE FUNCTIONS

Example

1. Graph the function

$$f(x) = \begin{cases} 3 - x^2 & \text{if } x < 1 \\ x^3 - 4x & \text{if } x \geq 1 \end{cases}$$

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2. If $|x-3|=2$, find x.

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3. Find all values of x for which $|2x+3| \geq 5$.

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4. Given the graph of f(x) is shown below.

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5. If $f(x) = |x + 1| - 1$, what is the minimum value of f(x) ?

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6. Five examples of greatest integer function integer notation are:

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7. Sketech the graph of f(x) = [x].

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8. What is the range of $f(x) = \left[\frac{[x]}{x}\right]$.

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Exercises

1. $|2x - 1| = 4x + 5$ has how many numbers in its solution set ?

A. 0

B. 1

C. 2

D. an infinite number

Answer: B

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2. Which of the following is equivalent to $1 \leq |x-2| \leq 4$?

A. $3 \leq x \leq 6$

B. $x \leq 1$ or $x \geq 3$

C. $1 \leq x \leq 3$

D. $-2 \leq x \leq 1$ or $3 \leq x \leq 6$

Answer: D

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3. The area bound by the relation $|x| + |y| = 2$ is

A. 8

B. 1

C. 2

D. 4

Answer: A

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4. Given a function, f(x), such that f(x) = f(|x|). Which one of the following could be the graph of f(x) ?

A.

B.

C.

D.

Answer: N/A

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5. The figure shows the graph of which one of the following ?

A. $y = 2x - |x|$

B. $y = |x - 1| + x$

C. $y = |2x - 1|$

D. $y = |x + 1| - x$

Answer: B

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6. The postal rate for first-class mail is 44 cents for the first ounce or portion thereof and 17 cents for each additional ounce or portion thereof up to 3.5 ounces. The cost of a 3.5-ounce letter is $95¢$. A formula for the cost in cents of first-class postage for a letter weighing N ounces $(N \leq 3.5)$ is

A. $4 + [N - 1] \cdot 17$

B. $[N - 44] \cdot 17$

C. $44 + [N] \cdot 17$

D. none of the above

Answer: D

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7. If f(x) = n , where n is an integer such that $n \leq x < n + 1$, the range of f(x) is

A. the set of all real numbers

B. the set of all positive integers

C. the set of all integers

D. the set of all negative integers

Answer: C

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8. If $f(x) = [4x] - 2x$ with domain $0 \leq x \leq 2$

, then f(x) can also be written as

A. 2x

B. $-x$

C. $-2x$

D. none of the above

Answer: D

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