

GREATEST INTEGER FUNCTION

1 B

2 C

3 Example of an appropriate solution

Rule of Correspondence

$$C(n) = 10 - 0.40 \left[ \frac{n}{100} \right]$$

Number of kilograms of sugar ordered:

$$4 = 10 - 0.40 \left[ \frac{n}{100} \right]$$

$$-6 = -0.40 \left[ \frac{n}{100} \right]$$

$$15 = \left[ \frac{n}{100} \right]$$

Trial and error is an acceptable method of determining the solution set.

Answer: The possible quantities of sugar, in kilograms, are  $[1500, 1600[$ .

**Note:** Accept an equivalent notation for the solution set.

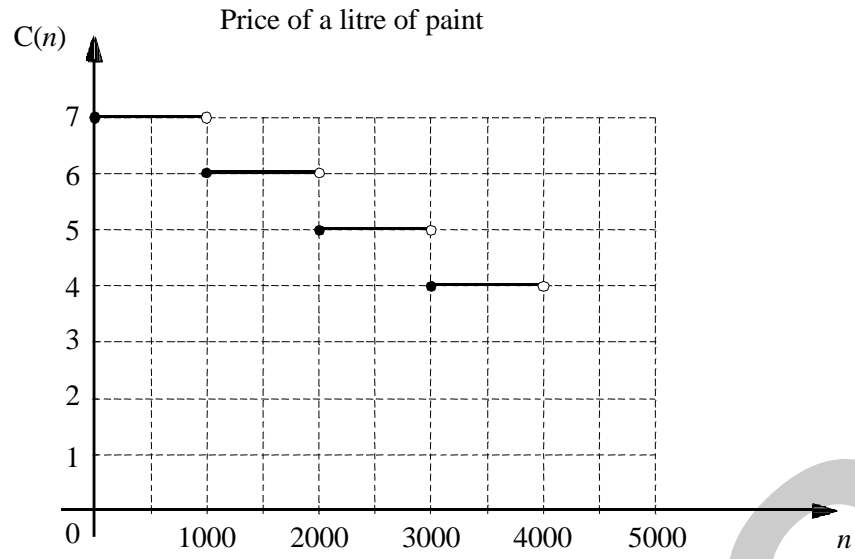
4 C

5 B

6 B

7 D

8 Price of a litre of paint



9 It will cost \$13.25 to send the parcel.

10 C

11 A

Name : \_\_\_\_\_

Group : \_\_\_\_\_

Date : \_\_\_\_\_

568536 - Mathematics

Question Booklet

1 The function  $f$  is defined by the following rule:

$$f(x) = 3 \left[ -\frac{(x-1)}{2} \right] + 6$$

What are the zeros of this function?

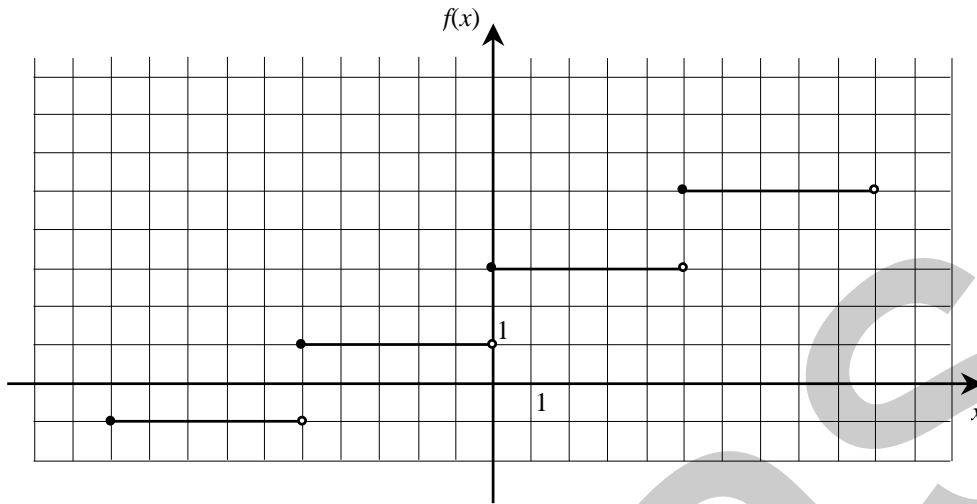
A)  $]1.5, 2[$

C)  $]5, 8[$

B)  $]3, 5]$

D)  $[5, 8[$

2 Given the standard form of the greatest integer function:  $f(x) = a[b(x - h)] + k$  and the following graph.



What are the respective values of parameters a and b?

A)  $\frac{1}{2}$  and  $\frac{1}{5}$

C) 2 and  $\frac{1}{5}$

B)  $\frac{1}{2}$  and 5

D) 2 and 5

- 3 A pastry chef orders sugar from his supplier. The cost of delivery,  $C(n)$ , depends on the number,  $n$ , of kilograms of sugar ordered. The supplier charges a flat rate of \$10 for delivery. However, he gives a rebate of \$0.40 for every 100 kg of sugar delivered.

The pastry chef recorded the delivery costs for the last five orders in the table below.

Quantity $n$ of sugar ordered (kg)	Cost of Delivery $C(n)$ (\$)
50	10
75	10
100	9.60
210	9.20
280	9.20

The delivery costs for today's order was \$4.

What are all the possible quantities of sugar the pastry chef could have ordered today?

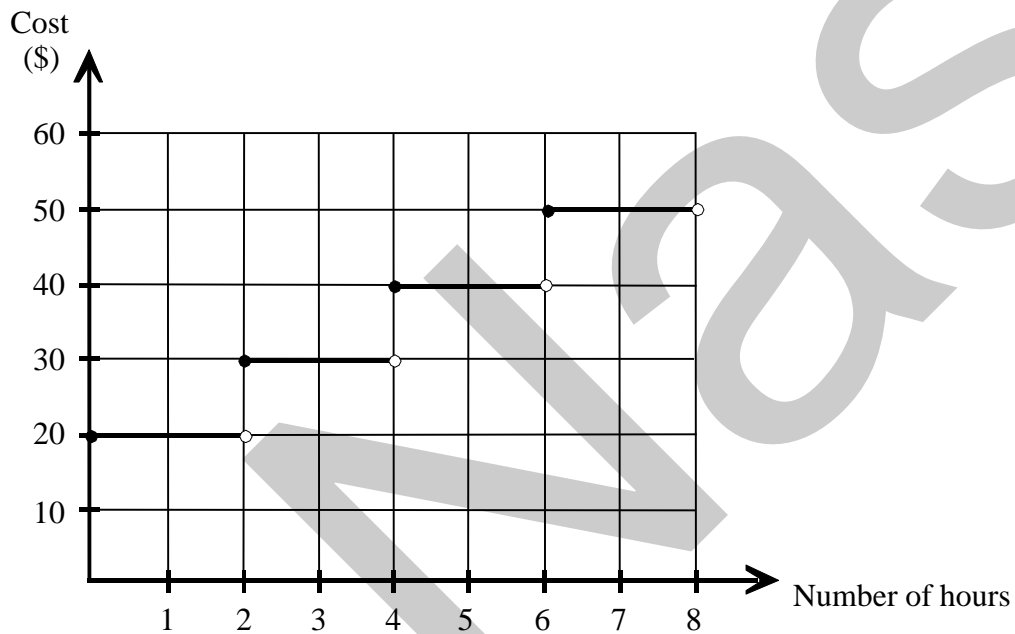
Show all your work.

4 The rental cost  $C(x)$  of a specialized tool is given by an equation of the form

$$C(x) = a[b(x - h)] + k$$

where  $x$  represents the number of rental hours.

The graph below represents the situation.



What are the respective values of the parameters  $a$ ,  $b$ ,  $h$  and  $k$ ?

A)  $-10, -2, 0, 20$

B)  $-10, \frac{-1}{2}, 0, 20$

C)  $10, \frac{1}{2}, 0, 20$

D)  $10, \frac{1}{2}, 20, 0$

5

A greatest integer function is defined by:

$$f(x) = 2[3x - 5] + 1$$

What is the image of this function?

A)  $\{y \in \mathfrak{R} \mid y = 2n, n \in \mathbb{Z}\}$

C)  $\{y \in \mathfrak{R} \mid y = n + 1, n \in \mathbb{Z}\}$

B)  $\{y \in \mathfrak{R} \mid y = 2n + 1, n \in \mathbb{Z}\}$

D)  $\{y \in \mathfrak{R} \mid y = 3n - 5, n \in \mathbb{Z}\}$

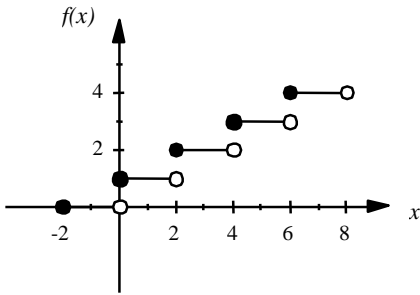


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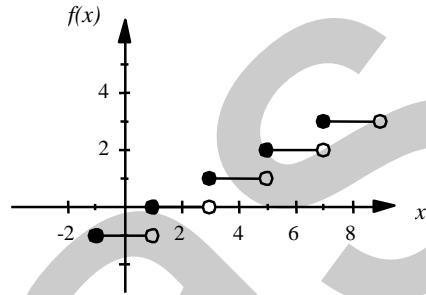
Which of the graphs below represents the function

$$f(x) = \left[ \frac{x-1}{2} \right] + 2?$$

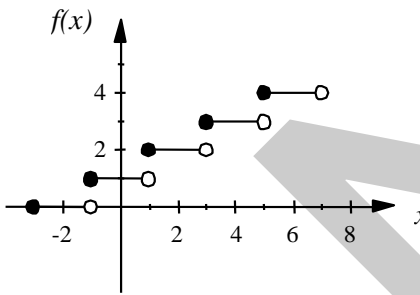
A)



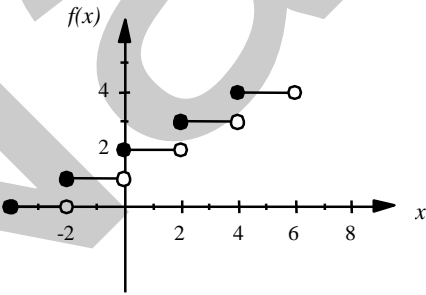
C)



B)



D)



7 The weekly salary  $s(n)$  of a car salesperson is established by the equation

$$s(n) = 200 \left[ \frac{1}{2}(n + 3) \right] + 200$$

where  $n$  is the number of cars sold in a week.

What salaries are possible for someone who sells fewer than 8 cars?

- A) \$500, \$600, \$700, \$800, \$900, \$1000, \$1100, \$1200
- B) \$0, \$600, \$800, \$1000, \$1200
- C) \$600, \$800, \$1000, \$1200
- D) \$400, \$600, \$800, \$1000, \$1200

- 8 A paint company computerized its billing service using a program based on the function  $c(n)$  defined below.

Price of a litre of paint

$$c(n) = -\left[\frac{n}{1000}\right] + 7$$

where  $c(n)$  represents the price of one litre of paint and  $n$  the number of litres sold.

Draw the graph of this function for  $0 \leq n < 4000$ .

- 9 The cost  $C$ , in dollars, to send a parcel is given by the function  $C(x) = [2.75x] + 1.25$  where  $x$  is the mass in kg.

How much will it cost Danielle to send a parcel that weighs 4.4 kg?

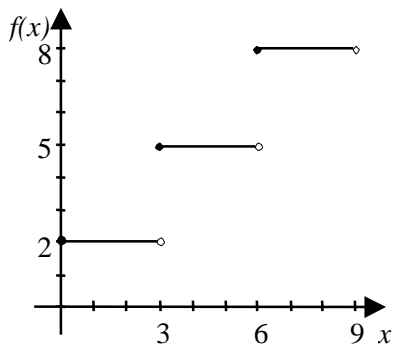
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The rate charged to mail a package is determined by the function  $f(x) = 3\left[\frac{1}{2}x\right] + 2$

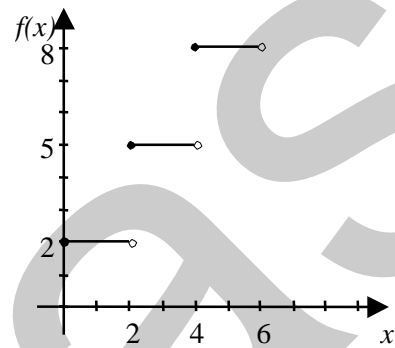
where  $f(x)$  represents the rate to mail a package weighing  $x$  kilograms.

Which of the following graphs illustrates this situation?

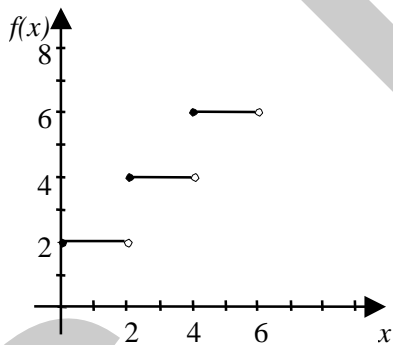
A)



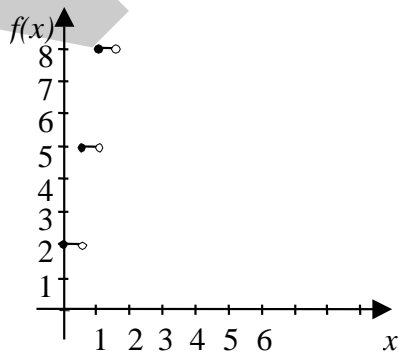
C)



B)



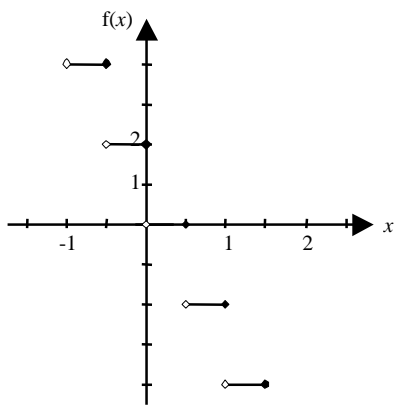
D)



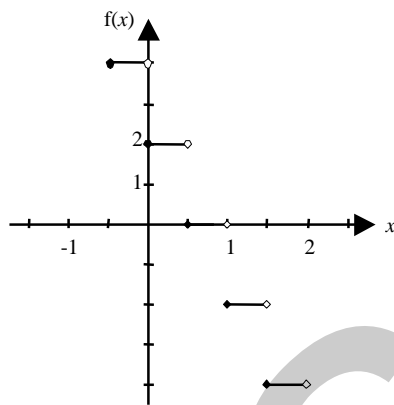
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Which of graphs below represents the equation  $f(x) = 2[-2x] + 2$ ?

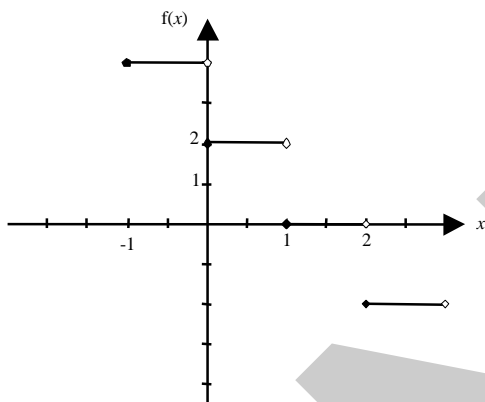
A)



C)



B)



D)

