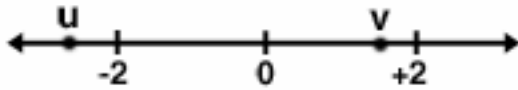


Your name: \_\_\_\_\_

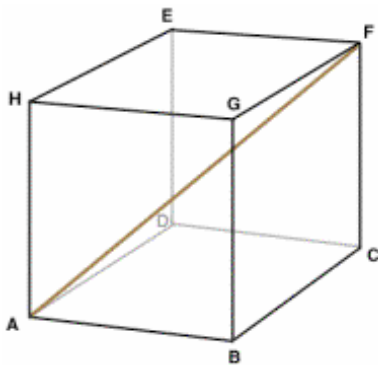
1. How many points are there on the line shown that are  $\frac{1}{2}$  as far from  $v$  as they are from  $u$ ?

- (A) 0
- (B) 1
- (C) 2
- (D) 4
- (E) An infinite number of points.



-- Use this space to explore and solve the problem --

2. The cube pictured has sides of length 1.



Is the length of AF...

- (A)  $< \sqrt{2}$
- (B)  $> \sqrt{2}$
- (C)  $= \sqrt{2}$
- (D) There is insufficient information to solve it.

-- Use this space to explore and solve the problem --

3. Given that  $a$ ,  $b$ , and  $c$  are consecutive integers, which of the following must be even?

- I.  $a+b+c$
- II.  $abc$
- III.  $b(a+c)$

- (A) I only.
- (B) I and III
- (C) II and III
- (D) There is insufficient information to solve it.

-- Use this space to explore and solve the problem --

4. One fifth of criminals are hard-core criminals. The hard-core criminals commit two-thirds of the criminal acts. Is the ratio of the number of criminal acts committed by the average hard-core criminal to the number committed by the average criminal who is not hard-core...

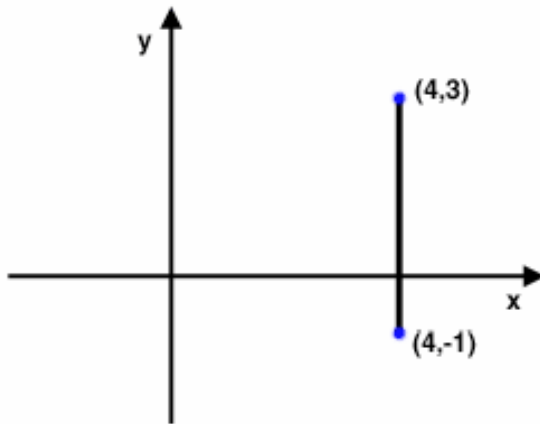
- (A)  $> 4$       (B)  $< 4$       (C)  $= 4$       (D) There is insufficient information to solve it.

-- Use this space to explore and solve the problem --

5.

In the figure below, the line segment joining the points (4,3) and (4,-1) forms one side of an isosceles triangle.

Which of the following could be the coordinates of another vertex of that triangle?



- (A) (0,3)  
 (B) (1,2)  
 (C) (0,0)  
 (D) (3,0)  
 (E) (1,-1)

-- Use the graph provided to explore and solve the problem --

6. A straight line is drawn through a circle of radius 5 such that it cuts the circle into two pieces. To one side of the line, the length of arc is  $5 * \pi$ . What is the area of the portion of the circle on the other side of the line?

- (A)  $5 * \pi$       (B)  $10 * \pi$       (C)  $12 \frac{1}{2} * \pi$   
 (D)  $25 * \pi$       (E) Not enough information to solve the problem.

-- Use this space to explore and solve the problem --

Your name: \_\_\_\_\_

7.

For all positive integers, let  $(a \blacklozenge b)$  be defined as  $(a \blacklozenge b) = (a^2 / b^2)$ .

Is...

(A)  $1/(30 \blacklozenge 31) < 1/(31 \blacklozenge 30)$

(B)  $1/(30 \blacklozenge 31) > 1/(31 \blacklozenge 30)$

(C)  $1/(30 \blacklozenge 31) = 1/(31 \blacklozenge 30)$

(D) There is insufficient information to solve it.

-- Use this space to explore and solve the problem --

8. A company charges 3 dollars per clay pot and 4 dollars per ceramic pot. Every purchase also has a 10% tax. If Anna buys 20 clay pots and 30 ceramic pots, what is the average cost per pot (in dollars), including the tax?

-- Use this space to explore and solve the problem --

9. A cylindrical water pitcher is 13 inches tall and has a radius of 5 inches. A solid cylinder, half as tall as the pitcher and with a radius of 2.5 inches is placed inside the pitcher. By what fraction is the amount of water the pitcher can hold reduced?

-- Use this space to explore and solve the problem --

10.

Three years ago, men made up two out of every three internet users in America. Today the ratio of male to female users is about 1 to 1.

In that time the number of American females using the internet has grown by 30,000,000, while the number of males who use the internet has grown by 100%.

By how much has the total internet-user population increased in America in the past three years?

- (A) 50,000,000
- (B) 60,000,000
- (C) 80,000,000
- (D) 100,000,000
- (E) 200,000,000

-- Use this space to explore and solve the problem --

11.  $n$  is a positive odd integer. Letting  $A =$  Twice the number of factors of  $n$ , and  $B =$  The number of factors of  $2n$ . Is ...

- (A)  $A < B$     (B)  $A > B$     (C)  $A = B$     (D) There is insufficient information to solve it.

-- Use this space to explore and solve the problem --