

I'm posting the next set of medium/hard DS questions. I'll post OA's with detailed explanations after some discussion. Please, post your solutions along with the answers. Good luck!

1. Bonnie can paint a stolen car in  $x$  hours, and Clyde can paint the same car in  $y$  hours. They start working simultaneously and independently at their respective constant rates at 9:45am. If both  $x$  and  $y$  are odd integers, is  $x=y$ ?

- (1)  $x^2 + y^2 < 12$
- (2) Bonnie and Clyde complete the painting of the car at 10:30am

Solution: [the-discreet-charm-of-the-ds-126962-20.html#p1039633](http://the-discreet-charm-of-the-ds-126962-20.html#p1039633)

2. Is  $xy \leq 1/2$ ?

- (1)  $x^2 + y^2 = 1$
- (2)  $x^2 - y^2 = 0$

Solution: [the-discreet-charm-of-the-ds-126962-20.html#p1039634](http://the-discreet-charm-of-the-ds-126962-20.html#p1039634)

3. If  $a$ ,  $b$  and  $c$  are integers, is  $abc$  an even integer?

- (1)  $b$  is halfway between  $a$  and  $c$
- (2)  $a = b - c$

Solution: [the-discreet-charm-of-the-ds-126962-40.html#p1039637](http://the-discreet-charm-of-the-ds-126962-40.html#p1039637)

4. How many numbers of 5 consecutive positive integers is divisible by 4?

- (1) The median of these numbers is odd
- (2) The average (arithmetic mean) of these numbers is a prime number

Solution: [the-discreet-charm-of-the-ds-126962-40.html#p1039645](http://the-discreet-charm-of-the-ds-126962-40.html#p1039645)

5. What is the value of integer  $x$ ?

- (1)  $2x^2 + 9 < 9x$
- (2)  $|x+10| = 2x+8$

Solution: [the-discreet-charm-of-the-ds-126962-40.html#p1039650](http://the-discreet-charm-of-the-ds-126962-40.html#p1039650)

6. If  $a$  and  $b$  are integers and  $ab=2$ , is  $a=2$ ?

- (1)  $b+3$  is not a prime number
- (2)  $a > b$

Solution: [the-discreet-charm-of-the-ds-126962-40.html#p1039651](http://the-discreet-charm-of-the-ds-126962-40.html#p1039651)

7. A certain fruit stand sold total of 76 oranges to 19 customers. How many of them bought only one orange?

- (1) None of the customers bought more than 4 oranges
- (2) The difference between the number of oranges bought by any two customers is even

Solution: [the-discreet-charm-of-the-ds-126962-40.html#p1039655](http://the-discreet-charm-of-the-ds-126962-40.html#p1039655)

8. If  $x=0.abcd$ , where  $a$ ,  $b$ ,  $c$  and  $d$  are digits from 0 to 9, inclusive, is  $x > 7/9$ ?

- (1)  $a+b > 14$
- (2)  $a-c > 6$

Solution: [the-discreet-charm-of-the-ds-126962-40.html#p1039662](http://the-discreet-charm-of-the-ds-126962-40.html#p1039662)

9. If  $x$  and  $y$  are negative numbers, is  $x < y$ ?

- (1)  $3x + 4 < 2y + 3$
- (2)  $2x - 3 < 3y - 4$

Solution: [the-discreet-charm-of-the-ds-126962-40.html#p1039665](http://the-discreet-charm-of-the-ds-126962-40.html#p1039665)

10. The function  $f$  is defined for all positive integers  $a$  and  $b$  by the following rule:  $f(a,b) = (a+b)/\text{GCF}(a,b)$ , where  $\text{GCF}(a,b)$  is the greatest common factor of  $a$  and  $b$ . If  $f(10,x)=11$ , what is the value of  $x$ ?

- (1)  $x$  is a square of an integer
- (2) The sum of the distinct prime factors of  $x$  is a prime number.

Solution: [the-discreet-charm-of-the-ds-126962-40.html#p1039671](http://the-discreet-charm-of-the-ds-126962-40.html#p1039671)

11. If  $x$  and  $y$  are integers, is  $x$  a positive integer?

- (1)  $x^*|y|$  is a prime number.
- (2)  $x^*|y|$  is non-negative integer.

Solution: [the-discreet-charm-of-the-ds-126962-40.html#p1039678](http://the-discreet-charm-of-the-ds-126962-40.html#p1039678)

12. If  $6a=3b=7c$ , what is the value of  $a+b+c$ ?

- (1)  $ac=6b$
- (2)  $5b=8a+4c$

Solution: [the-discreet-charm-of-the-ds-126962-40.html#p1039680](http://the-discreet-charm-of-the-ds-126962-40.html#p1039680)