

Data Sufficiency

Memorize the answers; they are always the same...

- a. Statement 1 alone is sufficient to answer the question, but statement 2 alone is not sufficient
- b. Statement 2 alone is sufficient to answer the question, but statement 1 alone is not sufficient
- c. Both statements together are needed to answer the question, but neither statement alone is sufficient
- d. Either statement by itself is sufficient to answer the question**
- e. Not enough facts are given to answer the question

$$ab < 0?$$

-(1); No

-(2); No

D

Is ab positive?

(1) $(a+b)^2 > (a-b)^2$

(2) $\frac{a}{b} = 1$

-(2) $\begin{matrix} a & = & b \\ + & & + \\ - & & - \end{matrix}$; yes

$$ab > 0?$$

$$\begin{matrix} + & + \\ - & - \end{matrix}$$

-(1) $\cancel{a^2} + 2ab + \cancel{b^2} > \cancel{a^2} - 2ab + \cancel{b^2}$

$4ab > 0$
 $ab > 0$; yes

- (1)	(1)	(1)	(1/2)
(2)	- (2)	(2)	
A	B		E

- (1)	(1)
- (2)	(2) - (1/2)
D	C

Go the distance

Don't bail out too quickly, sometimes the problems require effort.

Handwritten work for a multiplication problem:

$$\begin{array}{r}
 \clubsuit \\
 \times \heartsuit \\
 \hline
 \diamond \spadesuit
 \end{array}$$

Handwritten notes and calculations:

- $\clubsuit = 8$ (written in red)
- $\heartsuit = 4$ (written in red)
- $\diamond = 3$ (written in red)
- $\spadesuit = 2$ (written in red)
- $\diamond > \spadesuit$ (written in red)
- Handwritten numbers: 8, 4, 3, 2, 1, 2, 4, 8, 16, 32, 40, 48, 56, 64, 72, 80, 88, 96, 104, 112, 120, 128, 136, 144, 152, 160, 168, 176, 184, 192, 200, 208, 216, 224, 232, 240, 248, 256, 264, 272, 280, 288, 296, 304, 312, 320, 328, 336, 344, 352, 360, 368, 376, 384, 392, 400, 408, 416, 424, 432, 440, 448, 456, 464, 472, 480, 488, 496, 504, 512, 520, 528, 536, 544, 552, 560, 568, 576, 584, 592, 600, 608, 616, 624, 632, 640, 648, 656, 664, 672, 680, 688, 696, 704, 712, 720, 728, 736, 744, 752, 760, 768, 776, 784, 792, 800, 808, 816, 824, 832, 840, 848, 856, 864, 872, 880, 888, 896, 904, 912, 920, 928, 936, 944, 952, 960, 968, 976, 984, 992, 1000.

1. In the multiplication problem shown above, each of the symbols \clubsuit , \heartsuit , \diamond and \spadesuit represents a positive digit. If $\diamond > \spadesuit$ and $\clubsuit > \heartsuit$, what is the value of \heartsuit ?

- (1) $\clubsuit = 8$
(2) $\diamond = 3$

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Tix? Profit?

Spend more time on the question

Ask yourself what information you need to know before plunging into the statements.

2. A group of theater owners made an arrangement with an acting company that the theater owners would get \$5 in profit for every ticket sold to a show. How much profit did the theater owners earn from ticket sales?

(X)

- (1) The total revenue from ticket sales was \$700.
(2) If 30 more tickets had been sold, the theater owner's profit would have been increased by 30 percent.

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$$-(2) \quad 150 = 30\% (P)$$

Find the value and the yes/no questions

3. What is the value of x ? $-(1) \quad x^2 - 10x + 25 = 0$

(1) $x^2 + 25 = 10x$

(2) $x^2 - 8x = -15$

$$(x-5)(x-5) = 0$$

$$x = 5$$

A

~~(2)~~ $x^2 - 8x + 15 = 0$

$$(x-5)(x-3) = 0$$

$$x = 5 \text{ or } x = 3$$

4. Is $x/y < 0$?

(1) $|x| \neq x$

(2) $|x| = -y$

$$\frac{x}{y} < 0? \quad \frac{-}{+} \text{ or } \frac{+}{-}$$

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~~(1)~~ ~~(2)~~

$$|x| = -y$$

$$y < 0$$

$$\frac{+}{-} \quad \frac{+}{-} \quad \frac{-}{-}$$

$$\frac{x}{y}$$

$$\frac{-}{-}$$

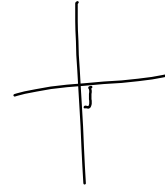
$$\frac{+}{-}$$

; No

; yes

$-(1/2) \quad x < 0$
 $y < 0$

5. Two intersecting lines form four angles. Are the lines perpendicular?
- (1) Each of the angles is equal to exactly one of the other three angles.
(2) The sum of three of the angles does NOT equal to 270 degrees.
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-(1) Not \perp

-(2) Not \perp



Stupid easy traps:

Solve each of the following and match each with the appropriate trap.

Assumption Trap
No Relation Trap
Redundancy Trap
Whole Story Trap

Amnesia Trap
Distraction Trap
Stating the Obvious
Fraction Trap

Delay Trap
Yes/No Trap
Month Trap
Unnecessary Info Trap

Average Trap
Find the Value Trap
Name Game Trap
The C Trap

6. What was the combined average attendance of the Economics class for the months of December and January?

- (1) The average attendance for the month of December was 45, and the Average attendance for the month of January was 52.
(2) On the days the attendees are not in class they go fishing.

E

7. Two masons build a wall alternately. How many hours do they take to build the entire wall?

- (1) The first mason needs 10 hours to build the wall alone.
(2) The second mason needs 14 hours to build the wall alone.

E

8. How many adults Ride bicycles in City A if all adults in City A ride bicycles or drive cars?

- (1) 85% of the 10,000 adults in city A drive cars.
(2) 8,500 adults in city A drive cars.

A, (1)
~~A~~

9. Is $ay = 6 - ax$?

- (1) $2a(x+y) = 12$
 (2) $a = 0.75$

$$ax + ay = 6 \quad ?$$

$$a(x+y) = 6 \quad ?$$

$$(1) a(x+y) = 6$$

A

~~(2)~~

10. Michael sells twice as many \$20 tickets as Thomas, and Thomas sells three times as many \$10 tickets as Michael does. If there are only \$10 and \$20 tickets, how many tickets does Michael sell?

- (1) Thomas sold a total of 35 tickets.
 (2) Together Michael and Thomas sold 70 tickets for a total of \$1,000

C - TRAP

B

	M	T	Total
\$20	$2(x)$	$1(x)$	$3x$
\$10	$1(y)$	$3(y)$	$4y$

$$3x + 4y = 70$$

$$3x(20) + 4y(10) = 1000$$

~~$x + 3y = 35$~~

12. In what year did Grant and Kerry get married?

- (1) Grant's sister Loraine, who got married 2.5 years before Grant and Kerry got married, got married in 1964.
 (2) Grant and Kerry's 16th wedding anniversary was in 1982.

B

13. How old was Janet 2 years ago?

- (1) Jane is 6 years older than Carl.
(2) In 4 years Jane will be twice as old as Carl.

~~(1)~~ $J = C + 6$
~~(2)~~ $J + 4 = 2(C + 4)$
~~(1/2)~~ E

14. Series T is a sequence of numbers in which each term after the first term is x greater than the term that precedes it. What is the value of the fourth term in the sequence?

- (1) The first number of the series is twice the value of the first two digit number which is a multiple of a prime number.
(2) $y^3 = 27$

~~(1)~~ ~~(2)~~ E
 $x = ?$

15. Does $abc = 1$?

- (1) $ab = 1$
(2) $bc = 1$

E ~~(1)~~ ~~(2)~~ $\left(\frac{1}{2}\right)$

a	b	c
1	1	?
?	1	1
1	1	1 ; Yes
-1	-1	-1 ; No
$\frac{1}{8}$	8	$\frac{1}{8}$; No

16. What is the value of integer x ?

- (1) $x^2 < 13$
(2) $x^4 > 60$

~~(1)~~ $x = 1, 2, 3$
~~(2)~~ $x = 3, 4, 5, \dots$

$$(1/2) \times 3 = 1.5$$



17. In a clothing store, 60 percent of the shirts are short-sleeved and 70 percent of the shirts are cotton. If 20 percent of the cotton shirts are white, how many of the cotton shirts are white?

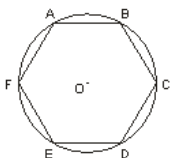
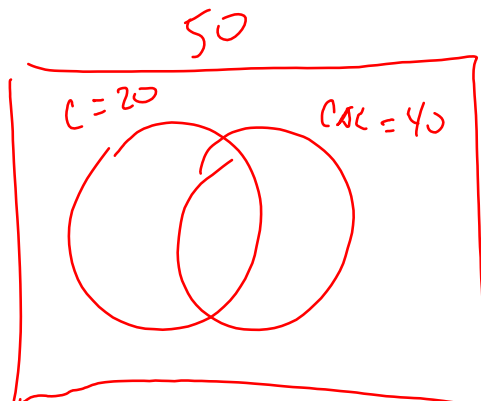
- (1) There are 300 short-sleeved shirts in the store.
(2) Of the shirts that are not cotton, $1/3$ are white.

$$- (1) 60\%(\text{?}) = 300$$

~~12~~

18. Of the 50 students who came to a party what percent of them study both chemistry and calculus?

- (1) 40% of them study chemistry.
(2) 80% of them study calculus.



19. In the figure above ABCDEF is a regular hexagon inscribed in a circle with its center at O. What is the length of minor arc AB?

- (1) $OA = 6$ inches
(2) Triangle OAB is equilateral.



~~12~~ - (1)

$$12 = 12 \quad -12 \quad -12$$

20. Is $x > y$?

(1) $3x = 4y$

(2) $k/3 = x$, $k/4 = y$ and $k > 0$

- (2) $k = 3x$
 $k = 4y$

$3x = 4y$

(3)

~~(1)~~ $3x = 4y$
 $4 > 3$

x y
 $-4 < -3$

X

The Killer Number Property Problems

What does it mean???

$ x \neq x$	
$ x = -y$	
$-2x < 0$	
$x^3 < 0$	
$x^2 = x$	
$x - y = y + 2$	
$x - y = \frac{1}{x + y}$	
$x^2 > x^3$	
$x^2 < x^4$	
$x^2 = y^2$	
$x^2 = xy$	
Average of a, b, c is b	
$a - b = b - c$	
$n^4 + 19 = 100$	

+

Have you considered everything?

21. What is the value of integer x ?

- (1) $x^2 < 13$
(2) $x^4 > 60$

$$\left(\frac{1}{2}\right) x = \pm 3$$

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22. Is $x^2 > x^3$?

- (1) $|x| \neq x$
(2) $x^2 < x^4$

$$x < 0? \quad \text{or} \quad 0 < x < 1?$$

$$- (1) \quad x < 0$$

$$\begin{aligned} \cancel{(2)} \quad x &= 2; \text{ No} \\ x &= -2; \text{ yes} \end{aligned}$$

A

23. Is x odd?

- (1) x^3 is odd
(2) $x^2 = x$

$$\cancel{(1)} \quad x^3 = \text{odd}$$

$x^3 =$	1	3	5	7
$x =$	1	$\sqrt[3]{3}$		
	Yes	No		

$$\cancel{(2)} \quad x^2 - x = 0$$

$$x(x-1) = 0$$

$$x = 0 \quad \text{or} \quad x = 1$$

✓

$$-\left(\frac{1}{2}\right) \times = 1$$

✓C✓

Insert for the Fact and Solve for what x could be.

24. If 4 students were added to a dance class, would the teacher be able to divide her students evenly into a dance team (or teams) of 8?

- (1) If 12 students were added, the teacher could put everyone in teams of 8 without any leftovers.
(2) The number of students in the class is currently not divisible by 8.

(A)

$$\frac{S+4}{8} \quad ? \quad (1) \quad S+12 = 16 \quad 24 \quad 32$$

$$S = 4 \quad 12 \quad 20$$

~~(Z)~~ $S = 1 \quad 2 \quad 3 \quad 4$
 $S+4 \quad 5 \quad 6 \quad 7 \quad 8$
 $\sim \sim \sim \checkmark$

$$S+4 = 8 \quad 16 \quad 24$$

$\sim \quad \checkmark \quad \checkmark \quad \checkmark$

25. Is the integer m odd?

- (1) m is a multiple of both 3 and 7.
(2) $m-7$ is an odd integer.

~~(X)~~ $m = 21 \quad 42 \quad 63$

3

-(2) $m-7 = 1 \quad 3 \quad 5 \quad 7$

$m = 8$	10	12	14
\sim	\sim	\sim	\sim

26. Is n an integer?

- (1) $7 \times n$ is odd.
(2) $2 \times n$ is even.

~~(X)~~ $7n = 1 \quad 3 \quad 5 \quad 7$

$n = 1/7$	$3/7$	$5/7$	1
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$-(2)$	$2n = 2$	1	6	8
	$n = 1$	2	3	4

(B)

27. Is the odd integer x a prime number?

- (1) $x + 2$ is a prime number.
 (2) $x - 3$ is a prime number.

~~(1)~~ odd + even
 $x + 2 =$ odd prime

(2) odd - odd = even prime
 $x - 3 = 2$
 $x = 5$

$x + 2$	=	3	5	7	11
x	=	1	3	5	9
		N	Y	Y	N

(B)

28. If a , b and c are all integers greater than 0, is the product of a , b and c even?

- (1) $a + b$ is prime
 (2) $c + b$ is even

~~(1)~~ $a + b =$ prime

$\begin{matrix} 1 & 1 & 2 \\ 2 & 1 & 3 \end{matrix}$

~~(2)~~ $c + b =$ even
 $\begin{matrix} 1 & 1 & 2 \end{matrix}$

a	b	c
1	1	?
?	1	1

(E)

~~(2)~~

$\begin{matrix} 1 & 1 & 1 \\ 2 & 1 & 1 \end{matrix}$; No
 ; Yes

Look for an equation...

Remember on Data Sufficiency it is not necessary to solve the problem but only to know if the problem can be solved?



29. If a train, traveling at a constant speed passes a man standing on platform, which is 50 meters long, in 9 seconds, what is the length of the train (assume that the man occupies only a point in space)?

- (1) The train passes the platform completely in 12 seconds. $-(1)$ $\frac{T}{9} = \frac{T+50}{12}$
 (2) The train is traveling at a speed of 60 km/h.

$-(2)$ $\frac{T}{9 \text{ sec}} = \frac{60 \text{ km}}{L_r}$

(D)

30. If a certain photograph collection consists of some black-and-white photographs and some color photographs, how many color photographs are in the collection?

- (1) If 5 more photographs, all of them black-and-white, were added to the collection, the ratio of color photographs to black-and-white photographs would then be 8 to 5.
 (2) There are 35 more color photographs than black-and-white photographs in the collection.

$C = ?$ ~~$\frac{C}{B+5} = \frac{8}{5}$~~ $C = B + 35$
 \boxed{C} $-(1/2)$

31. A credit card company offered a promotion in 1995 such that all users of credit card X would get a travel voucher at the end of the year equal in value to a fixed percentage of the amount of money charged on the credit card for that year. Mr. Pavlov charged d dollars on credit card X and Mrs. Pavlov charged \$3,400 on credit card X. If Mr. Pavlov got a travel voucher equal in value to \$380, what was the value of Mrs. Pavlov's travel voucher?

- (1) The vouchers were equal in value to \$0.05 for each dollar charged to credit card X in 1995.
 (2) $d = 7,600$

$-(1)$

(D)

$-(2)$

32. On a new manager's first day at an express mail delivery company, 25 percent of the first 60 packages were delivered late. After the first 60, all other packages that day were delivered on time. What is the total number of packages delivered on time the manager's first day?

- (1) A total of 120 packages were delivered on the manager's first day.
 (2) Of the packages delivered on the manager's first day, 87.5 percent were delivered on time.

15 late

1

- (1)

D

- (1) $12.5\% (x) = 15$

33. How many students are in the school?

X

- (1) 40 more than $\frac{1}{3}$ of all the students in the school are taking a science course and, of these, $\frac{1}{4}$ are taking Physics.
(2) Exactly $\frac{1}{8}$ of all the students in the school are taking Physics.

~~(1)~~ $40 + \frac{1}{3}x = S$

$\frac{1}{4}S = P$

$(\frac{1}{2})$

C

~~(2)~~ $\frac{1}{8}x = P$

If $s - \frac{1}{s} < \frac{1}{t} - t$ is $s < t$?

(1) $s > 1$

(2) $t > 0$

If $a \neq -b$, is $\frac{a-b}{a+b} < 1$?

(1) $b^2 > a^2$

(2) $a - b > 1$

Fun

22 March 2011

11:13

35. If $A+B \neq 0$, what is the sum of the three digit numbers $3A5$ and $4B7$?

- (1) A is even and B is a multiple of 3.
- (2) $A + B$ is divisible by 9

48. If $x = 6386B$, and B is the units digit of x , what is the value of B ?

- (1) $\frac{1}{2}x$ has a remainder of 1.
- (2) $x/7$ is an integer.

52. Is $n > p$?

(1) $m/n = p + n$

(2) $n > m$

58. If $x \neq 2$, what is the value of

$$\frac{(x-2)^n}{5} + \frac{(2-x)^n}{5} \quad ?$$

(1) $x^3 = 27$

(2) $\frac{1}{2}n$ has a remainder of 1.

61. If n is an integer, is 3^n less than 100?

(1) $3^{n+1} > 100$

(2) $3^{n-1} = 3^n - 162$

$$x^2 - 4x - 32 = 0$$

$$\downarrow$$
$$(x - 8)(x + 4)$$

$$\begin{array}{r} 1 \quad 32 \\ 2 \quad 16 \\ 4 \quad 8 \end{array}$$

$$x^2 - 20x + 36 = 0$$

$$(x - 18)(x - 2)$$

$$\begin{array}{r} 1 \quad 36 \\ 2 \quad 18 \\ 3 \quad 12 \\ 4 \quad 9 \\ 6 \quad 6 \end{array}$$

$$x^2 - 4x - 96$$

$$(x - 12)(x + 8)$$