

Name _____ School Team _____

Event 5: Team Problems (with calculators)

5th/6th grade Math Meet '08

Problem 3: Digit sum operation

The operation DS, which stands for digit sum, takes the digits of a number and adds them together.

Example: $DS(25) = 2 + 5 = 7$ $DS(184) = 1 + 8 + 4 = 13$

DS can be applied multiple times.

Example: $DS(DS(184)) = DS(13) = 4$

DS applied to a single digit number results in zero.

Example: $DS(3) = 0$

For the following problems, apply the DS operation and give the result.
(1 pt. each)

1) $DS(862,931) =$ _____

2) $DS(DS(5,871,024)) =$ _____

3) $DS(DS(DS(6,518,379))) =$ _____

4) $DS(DS(DS(7,623,895))) =$ _____

5) $DS(DS(DS(138,406)) + DS(DS(290,518))) =$ _____

Problem 3: Digit sum operation

For the following properties of the DS operation, circle the correct answer.
(1 pt. each)

	<u>Always</u>	<u>Sometimes</u>	<u>Never</u>
1) If N is divisible by 2, then $DS(N)$ is divisible by 2:	A	S	N
2) If N is divisible by 3, then $DS(N)$ is divisible by 3:	A	S	N
3) If N is divisible by 4, then $DS(N)$ is divisible by 4:	A	S	N
4) If N is divisible by 5, then $DS(N)$ is divisible by 5:	A	S	N
5) If N is divisible by 6, then $DS(N)$ is divisible by 6:	A	S	N
6) If N is divisible by 7, then $DS(N)$ is divisible by 7:	A	S	N
7) If N is divisible by 8, then $DS(N)$ is divisible by 8:	A	S	N
8) If N is divisible by 9, then $DS(N)$ is divisible by 9:	A	S	N

Problem 3: Digit sum operation

For the following properties of the DS operation, circle the correct answer.
(2 pts. each)

	<u>Always</u>	<u>Sometimes</u>	<u>Never</u>
1) For any positive, whole number M , $DS(M) < M$:	A	S	N
		<u>True</u>	<u>False</u>
2) If $DS(P) = DS(Q)$, then $P = Q$.		T	F
3) If $DS(P) > DS(Q)$, then $P > Q$.		T	F

For the following questions, state the desired number. (2 pts. each)

1) What is the smallest positive number X
such that $DS(X) > 0$? $X =$ _____

2) What is the smallest positive number X
such that $DS(DS(X)) > 0$? $X =$ _____

3) What is the smallest positive number X
such that $DS(DS(DS(X))) > 0$? $X =$ _____