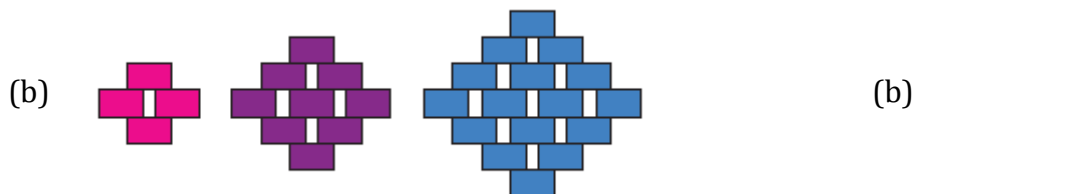


- 1) Find the next item in each pattern  
 (a) January, March, May, ... (a) \_\_\_\_\_



- (c) 4, 7, 12, 19, 28, ... (c) \_\_\_\_\_

- 2) Write a conjecture about the product of an even number and an odd number

- 3) Provide a counterexample to show that each statement is false.

- (a) If a number is divisible by 5, then it is divisible by 10.  
 (b) For every integer  $n$ ,  $n^3$  is positive.  
 (c) For any number  $n$ ,  $2n > n$ .

- 4) Use deductive reasoning to prove the following statement:  
 “The **sum of any three consecutive even numbers is divisible by three.**”

- 5) Use inductive reasoning to make a conjecture for the magic trick shown below. Then use deductive reasoning to prove your conjecture.

- Step 1: Choose a number  
 Step 2: Add 3  
 Step 3: Multiply by 2  
 Step 4: Add 4  
 Step 5: Divide by 2  
 Step 6: Subtract the number you started with

- 6) Dan is a high school student. All high school students like soccer. Therefore, Dan likes soccer. Where is the error in the reasoning?

- 7) Shelby was trying to prove the following number trick: Choose any number. Double your number. Add 20. Divide by 2. Subtract the original number. Each time Shelby tries the trick, she ends up with 10. Her proof, however, does not give the same result.

$n$	Choose any number	
$2n$	Double your number	Where did Shelby make a mistake?
$2n + 20$	Add 20	
$n + 20$	Divide by 2	
$n + 20 - n$	Subtract the original number	
20		