Name:_____

NetID:_____ **Lecture: A**

Discussion: Monday & Wednesday 1:30 2:30

(15 points) Working directly from the definition of divides, use (strong) induction to prove the following claim:

Claim: $7^n - 2^n$ is divisible by 5, for all natural numbers n.

Proof by induction on n.

Base case(s):

Inductive Hypothesis [Be specific, don't just refer to "the claim"]:

Rest of the inductive step:

CS 173, Summer 19 Examlet 7

Name:_____

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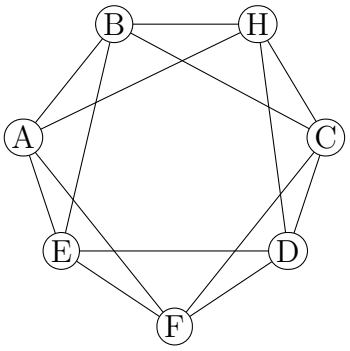
Discussion: Monday & Wednesday 1:30 2:30

1. (9 points) What is the chromatic number of the graph below? Justify your answer.



2. (6 points) Check the (single) box that best characterizes each item.

Chromatic number of W_{2n}. 2 ☐ 3 ☐ ≤ 3 ☐ ≤ 4 ☐

$\sum_{i=1}^{p} i$ $\frac{p(p-1)}{2}$ ☐ $\frac{(p-1)^2}{2}$ ☐ $\frac{p(p+1)}{2}$ ☐ $\frac{(p-1)(p+1)}{2}$ ☐

Leal team's bridge collapsed under a 100 pound weight. 100 pounds is _____ on how much the bridge can hold.

an upper bound on ☐ exactly ☐

a lower bound on ☐ not a bound on ☐