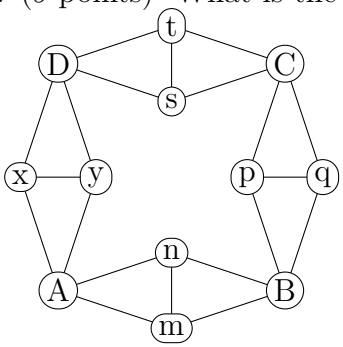
CS 173, Fall 2016
Examlet 7, Part B

NETID:

FIRST: | **LAST:**

Discussion: Thursday 2 3 4 5 Friday 9 10 11 12 1 2

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



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

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

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 ☐

Chromatic number of a bipartite graph with at least one edge

1 ☐ 2 ☐ 3 ☐ can't tell ☐

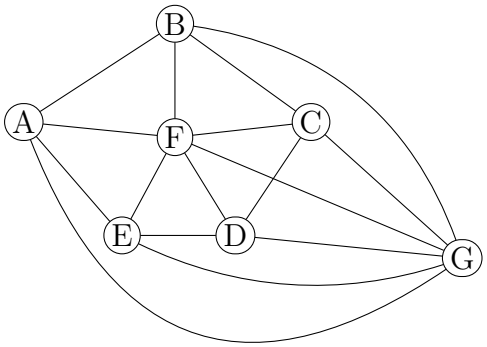
CS 173, Fall 2016
Examlet 7, Part B

NETID:

FIRST: **LAST:**

Discussion: Thursday 2 3 4 5 Friday 9 10 11 12 1 2

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



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

$\sum_{k=1}^{n-1} \frac{1}{2^k}$ $1-(\frac{1}{2})^n$ ☐ $2-(\frac{1}{2})^n$ ☐ $1-(\frac{1}{2})^{n-1}$ ☐ $2-(\frac{1}{2})^{n-1}$ ☐

$\pi \leq 7.3$ an upper bound on π ☐ exactly π ☐ a lower bound on π ☐ not a bound on π ☐

Chromatic number of a graph with maximum vertex degree D $= D$ ☐ $= D+1$ ☐ $\geq D+1$ ☐ $\leq D+1$ ☐

CS 173, Fall 2016
Examlet 7, Part B

NETID:

FIRST: | **LAST:**

Discussion: Thursday 2 3 4 5 Friday 9 10 11 12 1 2

1. (11 points) Let's define two sets as follows:

$$A = \{(p+1, p) \ : \ p \in \mathbb{R}\}$$
$$B = \{\lambda(1,0) + (1-\lambda)(2,1) \ : \ \lambda \in \mathbb{R}\}$$

Prove that $A = B$ by proving two subset inclusions.

2. (4 points) Check the (single) box that best characterizes each item.

Chromatic number of a graph with no edges — 1 ☐ 2 ☐ 3 ☐ can't tell ☐

Suppose I want to estimate $\frac{103}{50}$. 3 is _____ — an upper bound ☐ an exact answer ☐ a lower bound ☐ not a bound on ☐

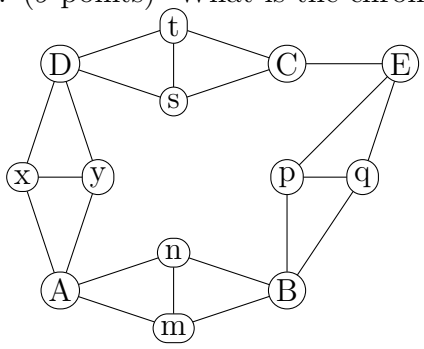
CS 173, Fall 2016
Examlet 7, Part B

NETID:

FIRST: | **LAST:**

Discussion: Thursday 2 3 4 5 Friday 9 10 11 12 1 2

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



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

The 10 students wouldn't fit into John's van. 10 is _____ how many students the van can carry.

an upper bound on ☐ exactly ☐
a lower bound on ☐ not a bound on ☐

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

Chromatic number of a graph with no cycles and at least one edge 1 ☐ 2 ☐ 3 ☐ can't tell ☐

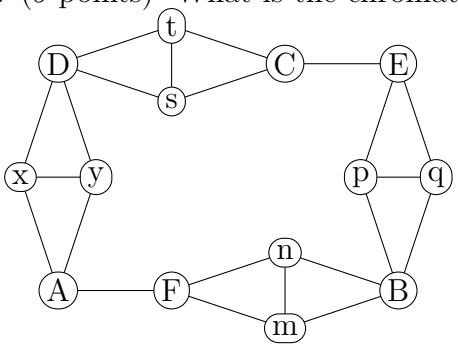
CS 173, Fall 2016
Examlet 7, Part B

NETID:

FIRST: | **LAST:**

Discussion: **Thursday** **2** **3** **4** **5** **Friday** **9** **10** **11** **12** **1** **2**

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



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

W_7 is a subgraph of graph H. 7 is ____ the chromatic number of H.

an upper bound on ☐ exactly ☐
a lower bound on ☐ not a bound on ☐

$\sum_{k=0}^{n-1} \frac{1}{2^k}$ $1-(\frac{1}{2})^{n-1}$ ☐ $2-(\frac{1}{2})^{n}$ ☐ $1-(\frac{1}{2})^{n}$ ☐ $2-(\frac{1}{2})^{n-1}$ ☐

Suppose I want to estimate $\frac{103}{20}$. 3 is ____

an upper bound ☐ an exact answer ☐
a lower bound ☐ not a bound on ☐

CS 173, Fall 2016
Examlet 7, Part B

NETID:

FIRST:	LAST:

Discussion: Thursday 2 3 4 5 Friday 9 10 11 12 1 2

1. (11 points) Let's define two sets as follows:

$$A = \{x \in \mathbb{R} \ : \ |x + 1| \leq 2\}$$
$$B = \{w \in \mathbb{R} \ : \ w^2 + 2w - 3 \leq 0\}$$

Prove that $A = B$ by proving two subset inclusions.

2. (4 points) Check the (single) box that best characterizes each item.

Chromatic number of a graph with no edges

1 ☐ 2 ☐ 3 ☐ can't tell ☐

Brandon fit 14 buns into the steamer basket. 14 is _____ how many on how many buns the basket can hold.

an upper bound on ☐ exactly ☐

a lower bound on ☐ not a bound on ☐