Test #1 review

#14 Disprove with a counter-example

p	p^2+2
3	11
5	27 ✓

$p = 13$, $p^2+2 = 171 = 3 \cdot 57$, not prime

$p = 5$, $p^2+2 = 27$, not prime

#15 Let G be a graph with 11 vertices all of degree 2.

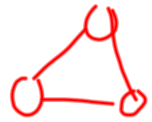
Then # edges $= \frac{11 \cdot 2}{2} = 11$

which is odd.

Counter-example!

Disproof

or

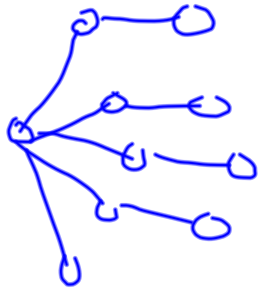


Counter-example

#16 – Proof: If avg = 10, then $\frac{x+y+z}{3} = 10$

$\rightarrow$ $x+y+z = 30$, which is even. ∎

#17 – False



Counter-example.

If you had a "proof" for #'s 14, 15 or 17, please learn from it. Learn to recognize steps in proofs that are not justified, don't follow from what came before.

The end of sets:

Reminder: $A \subseteq B$ if every element of A was also in B.

Note: For any set A, $\emptyset \subseteq A$.

Remember to be precise! A power set is a set of sets.

Def: If X is a set, then the power set of X, denoted $P(X)$ = the set of all subsets of X.

$X = \{a, b, c\}$, $P(X) = \{\{b,c\}, \{a,b\}, \{a,c\}, \{a,b,c\}, \{a\}, \{b\}, \{c\}, \emptyset\}$

$\cancel{\{b,a\}}$

Note: the order of the elements of a set is irrelevant. The elements are not ordered! $\{a,b\} = \{b,a\}$

thm: If a set X has n elements, then $\mathcal{P}(X)$ has 2^n elements.

(that is, $|\mathcal{P}(X)| = 2^{|X|}$)

Proof: Another day.

$$\mathcal{P}(\emptyset) = \{\emptyset\}$$

$$\mathcal{P}(\{a\}) = \{\{a\}, \emptyset\}$$

n	$\lvert\mathcal{P}(X)\rvert$
0	1
1	2
2	4
3	8
4	16
5	