

Day 1 - Conjectures & Counterexamples Practice

Directions: Determine a counterexample for the following conjectures.

Answers may vary!

1. $\angle 1$ and $\angle 2$ are supplementary, so one of the angles must be acute.

Two right angles can be supplementary

2. The sum of two numbers is greater than either number.

$$-2 + -1 = -3 \quad -3 \text{ is not greater than } -2 \text{ or } -1$$

3. All prime numbers are odd.

2 is prime and not odd

4. If an appliance is used to heat food, then it is a stove.

microwaves can heat food

5. If a creature has no legs, then it is a reptile.

A shark has no legs, but isn't a reptile

6. February is the only month with 28 days.

All months have 28 days

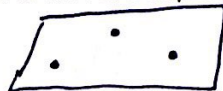
7. If a liquid is sweet, then it is a soda.

juice is sweet

8. All birds can fly.

Penguins can't fly

9. Any three points that are coplanar are also collinear.



Coplanar but not collinear

10. When a number is multiplied by 2, it is divisible by 4.

$$5 \times 2 = 10 \quad 10 \text{ is not divisible by } 4$$

11. All odd numbers can be written as the sum of two prime numbers.

$$3 \rightarrow 1 + 2 \quad 1 \text{ is not prime}$$

12. If the product of two numbers is positive, then both numbers must be positive.

Two negatives multiplied together become positive

Make a conjecture about the following statements (you may need to do specific examples to come up with the conjectures)

13. Make a conjecture about "The product of two consecutive numbers".

$$\begin{aligned} 2 \times 3 &= 6 && \nearrow +6 \\ 3 \times 4 &= 12 && \nearrow +8 \\ 4 \times 5 &= 20 && \nearrow +10 \\ 5 \times 6 &= 30 && \nearrow +12 \\ 6 \times 7 &= 42 && \nearrow +14 \end{aligned}$$

The product of two consecutive numbers is... ^{in order}

- even
- increased by 2 from the difference of the previous two numbers

14. Make a conjecture about the following picture:



Some sort of natural disaster occurred (tornado or hurricane)

15. Make a conjecture about the sum of two odd numbers.

$$\begin{aligned} 1 + 3 &= 4 \\ 3 + 7 &= 10 \\ 5 + 3 &= 8 \end{aligned}$$

The sum of two odd numbers is even.

16. Make a conjecture about the following problems:

$$101 \times 34 = \underline{3434} \quad 101 \times 25 = \underline{2525} \quad 101 \times 63 = \underline{6363} \quad 101 \times 71 = \underline{7171}$$

The product is the number multiplied by 101 and repeated

$$101 \times 45 = 4545.$$

17. Make a conjecture (using the picture below) about the relationship between the number of points on a circle and the number of regions created by connecting the points.



2 regions
2 points



4 regions
3 points



8 regions
4 points

The number of points on a circle and the number of regions doubles from the previous amount every time a point is added.