

1. Find the 19th odd integer.
2. Without adding all the terms up by hand, compute the sum $2 + 4 + 6 + 8 + \dots + 300$.
3. Give an example where inductive reasoning doesn't work.
4. How many *nonempty* subsets does the set $B = \{\emptyset, a, 12\}$ have ?
5. How many 1:1 correspondences are there from $\{1, 2, 3\}$ to $\{a, b, c\}$. Make up a tree diagram showing them.
6. Think of a number. Multiply it by 2. Add 2. Divide by 2. Subtract 1. Explain the trick and why it works.
7. Draw a Venn diagram showing two nonempty sets A and B for which $A \cup B = A$.
8. Suppose $A = \{1, 2, 9\}$ and $B = \{a, 2\}$. Find $A \times B$.
9. Suppose $f(x) = 3x + 1$ and the domain is $\{-3, 2, 5\}$. Describe $f(x)$ using two sets with directed arrows and as a collection of ordered pairs.
10. Use a truth table to determine when if ever the formula $p \rightarrow \neg q$ is true ?
13. Write the contrapositive of the statement "if I am hungry then I will eat".
14. Find the cardinality of the set $\{x \mid x = i - j, \text{ where } i, j \in \{1, 2, 3\}\}$
15. The long distance phone company Sprung charges \$5 a month and five cents a minute, and every fraction thereof, for long distance. Graph the monthly cost of using Sprung. What variable is more useful to put on the horizontal axis and why ? Is the graph a step function or a straight line ? Why ?
16. Suppose $f(x) = 2x - 3$ and $g(x) = x^2$. Draw a black box diagram for the composite function $g \circ f(x)$ and compute its value when $x = 5$.
17. Use a Venn diagram to determine if the following is valid:
 - . College classes are always a lot of fun.
 - Math 201 is a college class.
 - Therefore, Math 201 is always a lot of fun.
18. Use a numberline model to describe $6 - 2$.
19. Use both a partition model and repeated subtractions to describe $14 \div 5$
20. Express the decimal number 43 in base 5 and in binary.
21. Explain how to add $243_8 + 756_8$ working only in base 8.
22. Explain why division by zero isn't allowed, using an appropriate model.
23. Explain why the commutative law of multiplication holds using areas of rectangles.
24. What do you call the property that says $5 \cdot (2 + 4) = (5 \cdot 2) + (5 \cdot 4)$ and how would you explain it using a model ?
25. Review all the homework, all the quizzes, and your notes from class.