

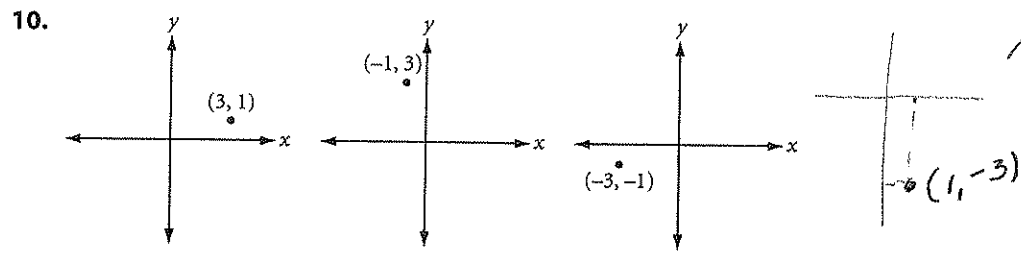
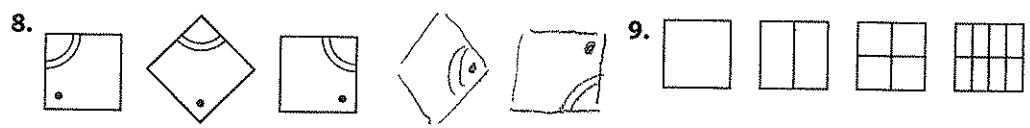
Inductive Reasoning

Name solutions. Period _____ Date _____

For Exercises 1-7, use inductive reasoning to find the next two terms in each sequence.

1. 4, 8, 12, 16, 20, 24 (+ 4)
2. 400, 200, 100, 50, 25, 12.5, 6.25 ($\div 2$)
3. $\frac{1}{8}, \frac{2}{7}, \frac{1}{2}, \frac{4}{5}, \frac{5}{4}, \underline{2}$ $\frac{1}{8} + 1 = \frac{2}{7} \mid \frac{2}{7} + 1 = \frac{3}{6} = \frac{1}{2} \mid \frac{3}{6} + 1 = \frac{4}{5} \mid \frac{4}{5} + 1 = \frac{5}{4} \mid \frac{5}{4} + 1 = 2$
4. -5, 3, -2, 1, -1, 0, -1, -1 see *
5. 360, 180, 120, 90, 72, 60 see * $\frac{6}{3} = 2$
6. 1, 3, 9, 27, 81, 243, 729 $\times 3$
7. 1, 5, 14, 30, 55, 91, 140 $5 = 1 + 4 \mid 14 = 5 + 9 \mid 30 = 14 + 16$ PERFECT SQUARES

For Exercises 8-10, use inductive reasoning to draw the next two shapes in each picture pattern.



→ (3, 1)

* $\textcircled{4}$ $-5 + 3 = -2$
 $-2 + 1 = -1$
 $1 + -1 = 0$
 $-1 + 0 = -1$
 $0 + -1 = -1$

$\textcircled{5}$ $360 \times \frac{1}{2} = 180$
 $180 \times \frac{2}{3} = 120$
 $120 \times \frac{3}{4} = 90$
 $90 \times \frac{4}{5} = 72$
 $72 \times \frac{5}{6} = 60$

For Exercises 11-13, use inductive reasoning to test each conjecture. Decide if the conjecture seems true or false. If it seems false, give a counterexample.

11. The square of a number is larger than the number.
 False $(\frac{1}{2})^2 = \frac{1}{4} < \frac{1}{2}$
12. Every multiple of 11 is a "palindrome," that is, a number that reads the same forward and backward.
 False $11 \cdot 10 = 110$ $11 \cdot 12 = 132$ False
13. The difference of two consecutive square numbers is an odd number.
 $(a+1)^2 - a^2$
 $a^2 + 2a + 1 - a^2$
 $2a + 1$ - is an odd number