

1.1 Finding and Describing Patterns

Goal: To be able to find patterns and use them to make predictions

WARM-UP EXERCISES

Evaluate.

1. $12 + (-28)$
2. $13 - (-5)$
3. $4^2 + 2^2$
4. $2 \cdot 4 + 2 \cdot 5 + 2 \cdot 6$

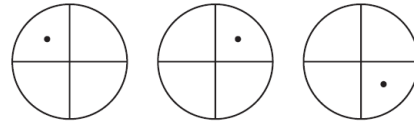
Write a variable expression for the given phrase.

5. Two times a number minus four
6. Nine more than eight times a number

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Describe a Visual Pattern

Describe a pattern in the figures.



SOLUTION

Each figure looks like the previous one rotated 90° .

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Describe a pattern in the figures.



1. After the first figure, one dot is being added to each of the top row and the bottom row of dots.
2. Larger and larger rings are being added to the figure. The rings are alternating in color between black and white.

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Describe a Number Pattern

Describe a pattern in the numbers.

- a. 22, 28, 34, 40, . . .

SOLUTION

- a. Each number after the first is 6 more than the previous number.
- b. $-4, -8, -16, -32, . . .$

SOLUTION

- b. Each number after the first is 2 times the previous number.

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Describe a pattern in the numbers.

3. $-6, -7, -8, -9, . . .$
4. 10, 30, 90, 270, . . .
3. Each number after the first is one less than the previous number.
4. Each number after the first is 3 times the previous number.

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Make a Prediction

Sketch the next figure you expect in the pattern.




SOLUTION





The shaded half of the square moves in the counter-clockwise direction each time. The fourth figure will have the lower half of the square shaded.

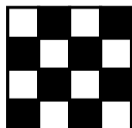
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Sketch the next figure you expect in the pattern.

5. 

6. 

5. 

6. 

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Make a Prediction

Write the next two numbers you expect in the pattern.
 $-10, -6, -2, 2, \dots$ And describe the pattern.

SOLUTION

Each number after the first is 4 more than the previous number. The next two numbers will be 6 and 10.

$-10, -6, -2, 2, 6, 10$

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****Write the next two numbers you expect in the pattern.**
****Describe the pattern.**

7. 3, 6, 12, 24, _____, _____ 8. 4, 1, -2, -5, _____, _____


7. 48, 96
Each number is 2 times the previous number.


8. -8, -11
Each number is 3 less than the previous number.


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Guided Practice

Skill Check Sketch the next figure you expect in the pattern.

1. 

2. 

3. 

4. 

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Describe a pattern in the numbers. Write the next two numbers you expect in the pattern.

5. 3, 11, 19, 27, ...
Each number is 8 more than the previous number; 35; 43.

6. 2, 6, 18, 54, ...
Each number is 3 times the previous number; 162; 486.

7. 7.0, 7.5, 8.0, 8.5, ...
Each number is 0.5 more than the previous number; 9.0; 9.5.

8. 13, 7, 1, -5, ...
Each number is 6 less than the previous number; -11; -17.

9. 256, 64, 16, 4, ...
Each number is $\frac{1}{4}$ the previous number; 1; $\frac{1}{4}$.

10. 3, 0, -3, 0, 3, 0, ...
The numbers in the odd-numbered positions alternate between 3 and -3; the numbers in the even-numbered positions are 0; -3; 0.

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