Sample Questions

**2.** The table below shows how the chirping of a cricket is related to the temperature outside. For example, a cricket chirps 144 times each minute when the temperature is 76°.

Number Of Chirps Per Minute	Temperature
144	76°
152	78°
160	80°
168	82°
176	84°

What would be the number of chirps per minute when the temperature outside is 90° if this pattern stays the same?

Answer: _____
Explain how you figured out your answer.

3.
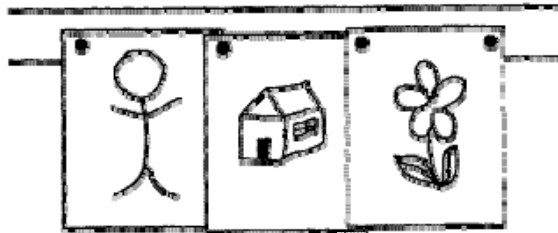
Children's pictures are to be hung in a line as shown in the figure above. Pictures that are hung next to each other share a tack. How many tacks are needed to hang 28 pictures in this way?
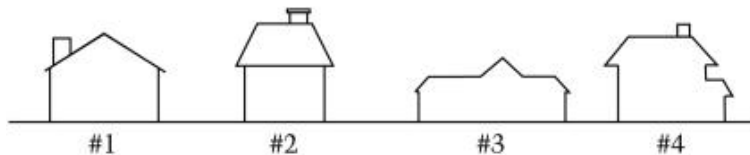
A) 27
B) 28
C) 29
D) 56

6. This question requires you to show your work and explain your reasoning. You may use drawings, words, and numbers in your explanation. Your answer should be clear enough so that another person could read it and understand your thinking. It is important that you show <u>all</u> your work.

A pattern of dots is shown below. At each step, more dots are added to the pattern. The number of dots added at each step is more than the number added in the previous step. The pattern continues infinitely.

(1st step)   **(2nd step)**   **(3rd step)**

2 Dots   6 Dots   12 Dots
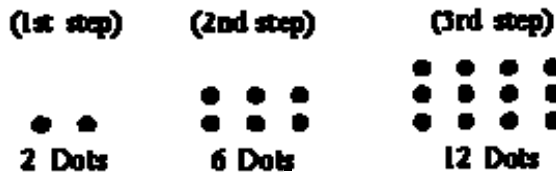
Marcy has to determine the number of dots in the 20th step, but she does not want to draw all 20 pictures and then count the dots. Explain or show how she could do this <u>and</u> give the answer that Marcy should get for the number of dots.

7.

#1   #2   #3   #4

Allen, Bridgitte, Chaz, and Diann each live in a different house on the same side of a street. The houses and their numbers are shown above.

- Only one of the other three people lives next to Bridgitte.
- Chaz lives next to Bridgitte and next to Diann.

Which person could live in house number 2?

A) Allen only
B) Chaz only
C) Diann only
D) Chaz or Diann
E) Any of these four people could live in house number 2.

10. This question requires you to show your work and explain your reasoning. You may use drawings, words, and numbers in your explanation. Your answer should be clear enough so that another person could read it and understand your thinking. It is important that you show <u>all</u> your work.

The first 3 figures in a pattern of tiles are shown below. The pattern of tiles contains 50 figures.
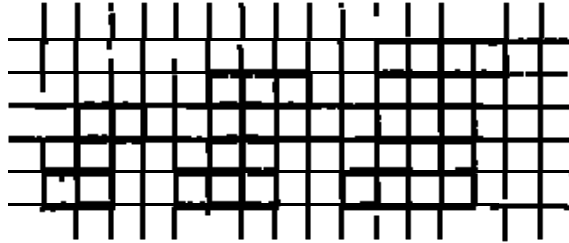
Describe the 20th figure in this pattern, including the total number of tiles it contains and how they are arranged. Then explain the reasoning that you used to determine this information. Write a description that could be used to define any figure in the pattern.

12. What is the least whole number x for which $2x > 11$?

A) 5
B) 6
C) 9
D) 22
E) 23

13. If $d = 110$ and $a = 20$ in the formula $d = \frac{a}{2}(2t - 1)$, then $t =$

A) $\frac{15}{22}$

B) $\frac{15}{8}$

C) 5

D) $\frac{111}{20}$

E) 6

14. This question requires you to show your work and explain your reasoning. You may use drawings, words, and numbers in your explanation. Your answer should be clear enough so that another person could read it and understand your thinking. It is important that you show <u>all</u> your work.
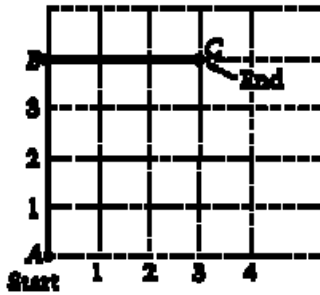
The darkened segments in the figure above show the path of an object that starts at point *A* and moves to point *C* at a constant rate of 1 unit per second. The object's distance from point *A* (or from point *C*) is the <u>shortest</u> distance between the object and the point.

In the space below, complete the following steps.
a) Sketch the graph of the distance of the object from point *A* over the 7-second period.
b) Then sketch the graph of the distance of the object from point *C* over the same period.
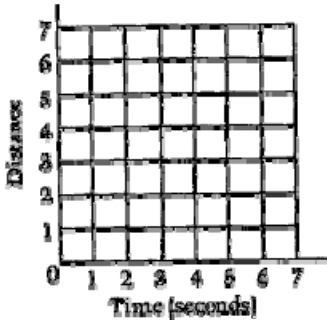
c) On your graph, label point *P* at the point where the distance of the object from point *A* is equal to the distance of the object from point *C*.
d) Between which two consecutive seconds is the object equidistant from points *A* and *C*?