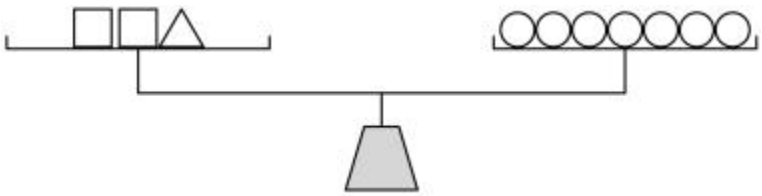
Sample Questions

1.



The objects on the scale above make it balance exactly. According to this scale, if △ balances ○○○, then □ balances which of the following?

A) ○
B) ○○
C) ○○○
D) ○○○○

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.

4. While she was on vacation, Tara sent 14 friends either a letter or a postcard. She spent $3.84 on postage. If it costs $0.20 to mail a postcard and $0.33 to mail a letter, how many letters did Tara send? Show what you did to get your answer.

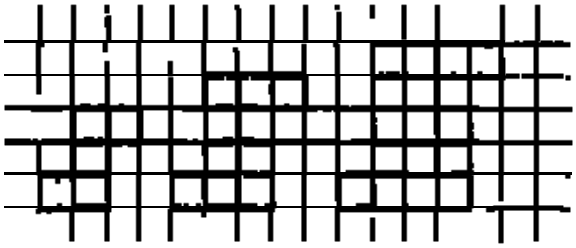
8. Tetsu rides his bicycle *x* miles the first day, *y* miles the second day, and *z* miles the third day. Which of

the following expressions represents the average number of miles per day that Tetsu travels?

A) $x + y + z$
B) xyz
C) $3(x + y + z)$
D) $3(xyz)$
E) $(x + y + z)/3$

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.

11. *The following question* refers to the graph shown below.

What is the value of $f(g(1))$?

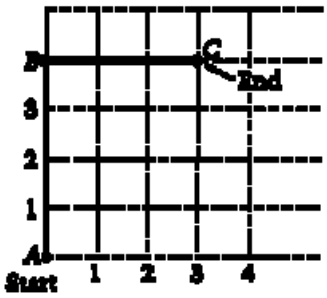
A) 2
B) 4
C) 5
D) 6
E) 8

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

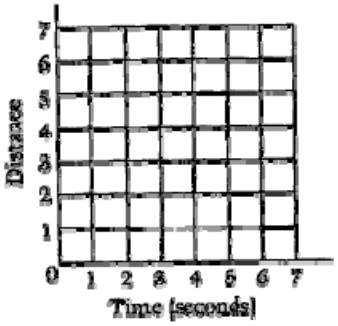
D) $\frac{111}{20}$
E) 6

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*?