Student Work Samples

The free response answers were scored with a rubric using the following categories:

        Extended

        Satisfactory

        Partial

        Minimal

        Incorrect

Work as a group to determine what score the following student responses received.

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.

Student Work Samples:

Answer: 194

Explain how you figured out your answer.

I vent up 8 chirps each 2°

Answer: 200 chirps

Explain how you figured out your answer.

Well each 2° it goes 8 more chips 86° it would be 184 chirps 88° it would be 192 chirps 90° it would be 200 chirps.

Answer: 180

Explain how you figured out your answer.

you just fugure the numbers and it will work you just add them together

Answer: 200

Explain how you figured out your answer.

I got my arner by contine-ing the graph until I got to 90°F Then I did the same on the other side

If you need more room for your work, use the space below.

*180
192
20
46
90*

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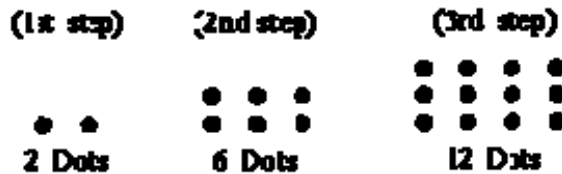
Marcy has to determine the number of dots in the 20th step, but she does not want to draw all 20 pictures and then count the dots. Explain or show how she could do this <u>and</u> give the answer that Marcy should get for the number of dots.

She could use a calculator and calculate 20 times (X) 21 and get 420.

638
I added the multiples of 2 up to 40 on a calculator.

You can see that every step is multiplied by three so on the 20th step it would have

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 '20
 ×21
 120
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adds one across and up

Each time the number of rows is 1 more and the number of columns is 1 more. So 4th step is 4 rows and 5 columns for 4 × 5 because you multiply rows times columns

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She would have to times 20 by 19 because she wants the 20th step and there would be 19 lines.

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

2 Dots   6 Dots   12 Dots

Mancy 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 and give the answer that Mancy should get for the number of dots.

$$\frac{1}{2}, \frac{2}{6}, \frac{3}{12}$$

$$\frac{1}{1\cdot2}, \frac{2}{2\cdot3}, \frac{3}{3\cdot4}$$

$$\frac{20}{x}$$

$$\frac{20}{20\cdot21}$$

$$\frac{20}{420}$$

Step #20 has 420 dots.

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400 dots

20
× 20
400

EACH STEP
YOU ADD 1 DOT
TO EACH SIDE. SO
AFTER 20 ADDITIONS
YOU HAVE A SQUARE
20 DOTS × 20 DOTS.

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 all your work.

The first 3 figures in a pattern of tiles are shown below. The pattern of tiles contains 50 figures.
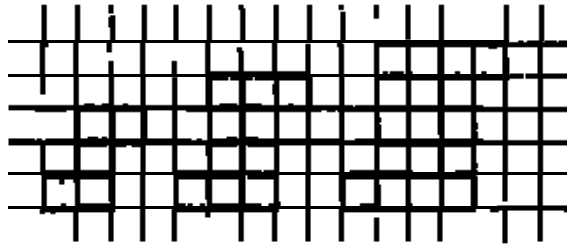

Describe the 20th figure in this pattern, including the total number of tiles it contains and how they are arranged. Then explain the reasoning that you used to determine this information. Write a description that could be used to define any figure in the pattern.

Student Work Samples:

1 = 3   1 = 2

2 = 4   2 = 3   Find the height and length.

3 = 5

20 = 22   q = 21

It will be 22 tiles tall with 21 tiles on the top and bottom row with 20 tiles in the middle 20 rows

It will have 21 tiles to the top and bottom...o...It will contain 20 middle with 20 tiles each. It will have 442 total tiles.

20th figure will have 442 tiles. Starting with the first pattern there is 2 greater

21 × □

20 × 20

21 × □

$\frac{37}{\cancel{}}$
$\frac{72}{85}$
$\frac{92}{97}$
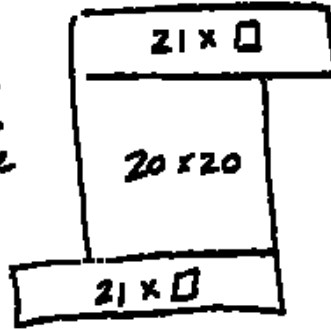
5 tiles are added to the pattern each time so figure 20 will have 97 tiles.
the figures are in ⌐ form with the vertical line widening by a row each time.

If you need more room for your work, use the space below!

The middle rows have the number of tiles that that diagram is in the pattern. Top and bottom rows have one more tile each.
Each diagram has six more tiles than the last.

Each figure increases 1 layer in height and 1 middle layer in width for every successive relation to the first. For example, for the nth section, the figure will be n+1 units across the base, n units wide, n+1 units across the top, and n+2 units high. This is the pattern. The 20th figure will be 21 units across on the bottom length, 20 units wide in the middle, 22 units high, and 21 units at the top. The increase is linear.
Total number of tiles it contains:
21 + (20 × 20) + 21 = 442
The inner square is always (n × n) units
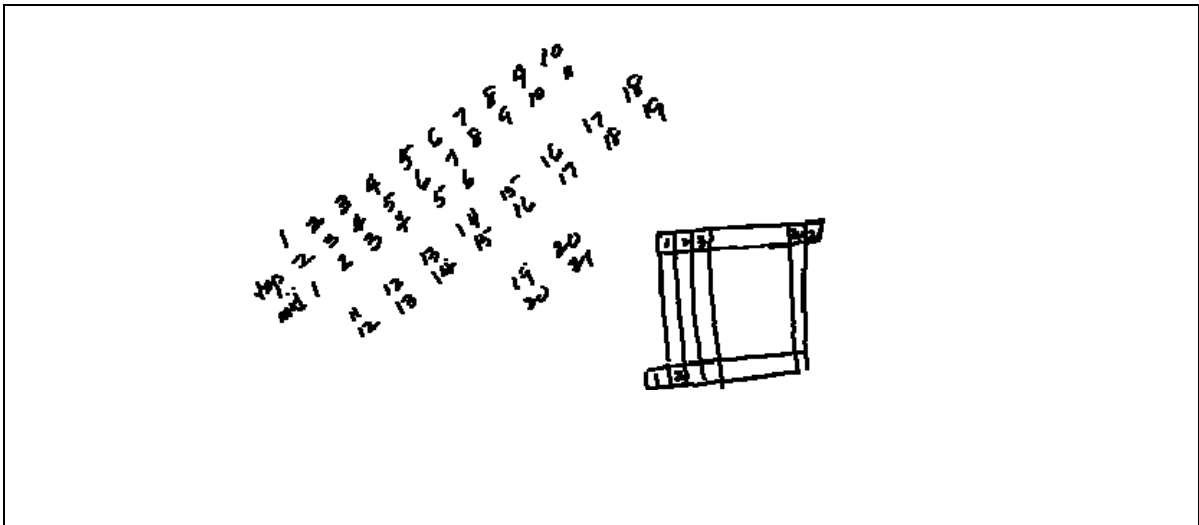
14. This question requires you to show your work and explain your reasoning. You may use drawings, words, and numbers in your explanation. Your answer should be clear enough so that another person could read it and understand your thinking. It is important that you show <u>all</u> your work.
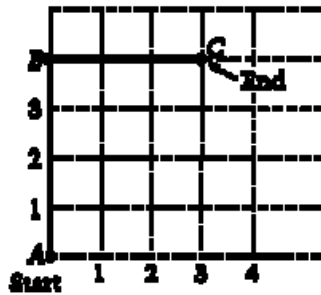
The darkened segments in the figure above show the path of an object that starts at point *A* and moves to point *C* at a constant rate of 1 unit per second. The object's distance from point *A* (or from point *C*) is the <u>shortest</u> distance between the object and the point.

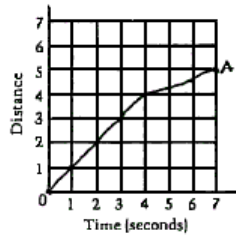In the space below, complete the following steps.
a) Sketch the graph of the distance of the object from point *A* over the 7-second period.
b) Then sketch the graph of the distance of the object from point *C* over the same period.
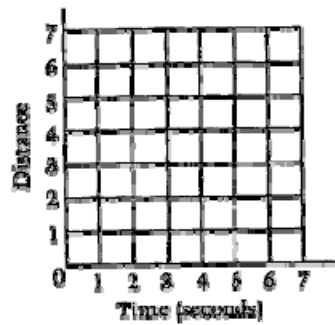
Time (seconds)

     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*.
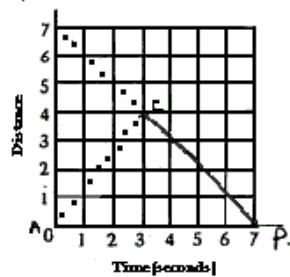   d) Between which two consecutive seconds is the object equidistant from points *A* and *C*?

Student Work Samples:

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.

Time (seconds)

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.

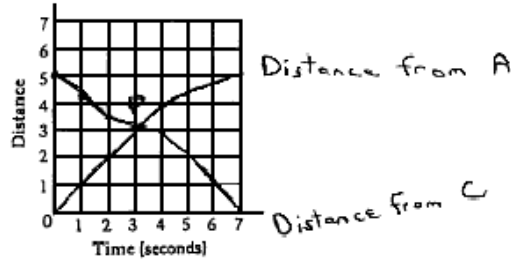d) Between which two consecutive seconds is the object equidistant from
points A and C?

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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.

Time (seconds)

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?   Point c + P

b) Then sketch the graph of the distance of the object from point *C* over the same period.
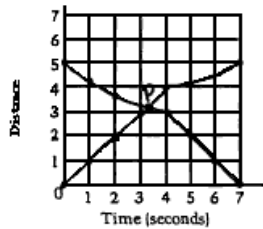

Distance from A

Distance from C

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?

3 and 4

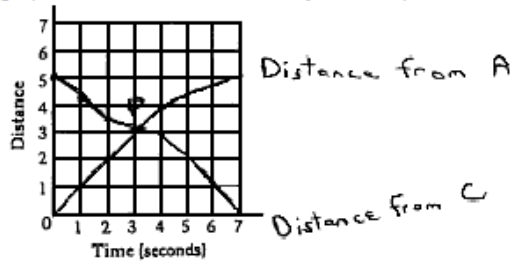b) Then sketch the graph of the distance of the object from point *C* over the same period.

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?

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b) Then sketch the graph of the distance of the object from point *C* over the same period.
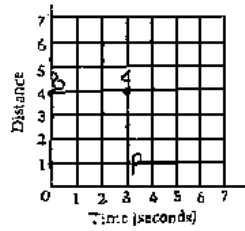

Distance from A

Distance from C

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?
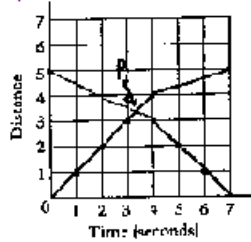
3 and 4

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?

Point P because it is
halfway between point
A and point C

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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?

3 ₊ 4