

Answer on Question #49379 – Math – Algebra

Suppose that by midnight the vertex of the front, which is maintaining the same shape, has moved 250 miles south and 210 miles east of Des Moines. Columbus, Ohio, is located approximately 550 miles east and 80 miles south of Des Moines. Plot the locations of Des Moines and Columbus together with the new position of the cold front.

Each unit represents 100 miles

Solution.

We have the function with Des Moines at $(0,0)$:

$$f(x) = \frac{1}{20}x^2$$

When the vertex of the front has moved 250 miles south, then the function will be:

$$f(x) = \frac{1}{20}x^2 - 2.5$$

and 210 miles east:

$$f(x) = \frac{1}{20}(x - 2.1)^2 - 2.5$$

Columbus is located ≈ 550 miles east and 80 miles south of Des Moines:

$$(5.5, -0.8)$$

So let's plot the locations with the cold front:

