Homework 1

Sam Windham, *Worked with Lucio Franco*

9/26/2017

1.

a.

```
CODE (var):
     my code block
     line 3 in block
```

Find the area under the line curve...

This is tex *math*. $\mathrm{O}(n^2)$

b.

text.

2.

a.

text.

3.

text.

4.

a.

The cross product of two vectors v_1 and v_2 gives us the area of the parallelogram that they form. Half of this area gives us the area formed between the two vectors. The polarity of the cross product is determined by the orientation of the two vectors since $v_1 \times v_2 = -(v_2 \times v_1)$.

For each pair of points p_i and p_{i-1} that share an edge, the formula finds the cross product of the vectors from the origin to those points. e.g.

$$(x_i, y_i) \times (x_{i-1}, y_{i-1}) = (x_i y_{i-1} - x_{i-1} y_i)$$

It then sums each of these cross-products and scales by 1/2. This leaves us with the area within the polygon. The orientation of the points correctly add and subtract the areas.

For a triangle (p_1, p_2, p_3), let v_1 be the vector from the origin to p_1, v_2 be the vector from origin to p_2, and v_3 be the vector from origin to p_3.

b.

text.

5.

a.

text

b.

text.

c.

text.

d.

text.