Algebra 2 Polynomial Application Problem Fall 2019

The length of a rectangle is defined by the following expression: $7 - 2x$
The width of this rectangle is defined by the following expression: $2x - 1$

1. Write an equation for the area of this rectangle in terms of x.

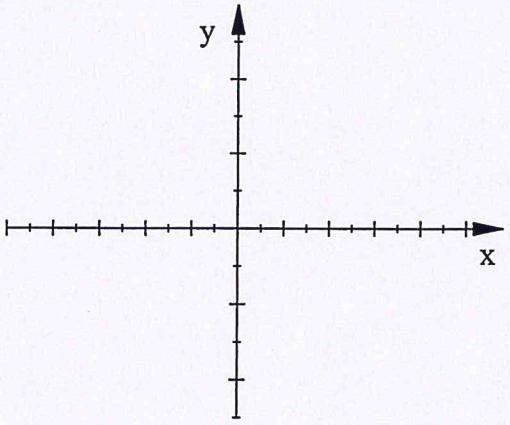
a) Write this equation factored form:
$A(x) =$

b) Give answer in Standard Form:
$A(x) =$

2. What is the domain of both of these equations?

3. What is the domain of these equations taking into consideration the real situation these equations represent?
(Hint: keep in mind that neither Length nor Width can be a negative value)

4. Graph one of these equations on your graphing calculator in a Standard Window. The two equations should result in the same graph. Sketch this on the graph below.



5. What value of x will lead to the maximum area? Round to the nearest hundredth.

6. What is the maximum area? Round to the nearest hundredth.

Algebra 2 Polynomial Application Problem Fall 2019 ANSWERS

The length of a rectangle is defined by the following expression: $7 - 2x$
The width of this rectangle is defined by the following expression: $2x - 1$

1. Write an equation for the area of this rectangle in terms of x.

a) Write this equation factored form:
$A(x) =$ $(7-2x)(2x-1)$

b) Give answer in Standard Form:
$A(x) =$ $-4x^2+16x-7$

2. What is the domain of both of these equations? $(-\infty, \infty)$

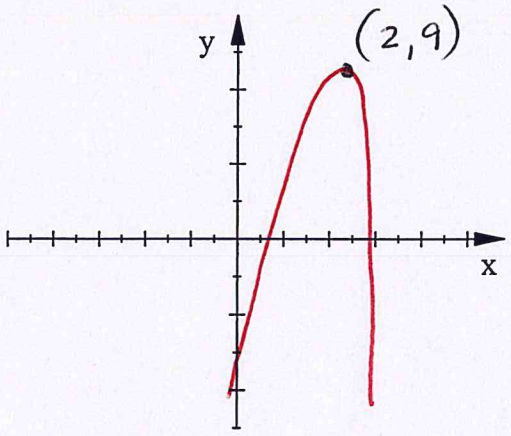
3. What is the domain of these equations taking into consideration the real situation these equations represent?
(Hint: keep in mind that neither Length nor Width can be a negative value)

$L > 0 \rightarrow 7-2x>0$
$-7 \quad -7$
$-2x > -7$
$\frac{-2x}{-2} > \frac{-7}{-2}$
$x < 3.5$

$W > 0 \rightarrow 2x-1>0$
$+1 \quad +1$
$2x > 1$
$\frac{2x}{2} > \frac{1}{2}$
$x > 1/2$

PUT THESE TOGETHER
$\frac{1}{2} < x < 3.5$
$(1/2, 3.5)$

4. Graph one of these equations on your graphing calculator in a Standard Window. The two equations should result in the same graph. Sketch this on the graph below.



Line of symmetry $x = \frac{-b}{2a} = \frac{-16}{2(-4)} = \frac{-16}{-8}$

$y = -4x^2+16x-7$

$x = 2$

vertex $(2, 9)$

$-4(2)^2+16(2)-7$
$= -16+32-7$
$= 16-7 = 9$

5. What value of x will lead to the maximum area? Round to the nearest hundredth.

2 x-coord of vertex

6. What is the maximum area? Round to the nearest hundredth.

9 y-coord of vertex