b) Yes, he is correct because none of the areas are altered.

c) \[ A = a^2 - a \]

d) \[ A = (a^2 + b^2) \]

\[ a^2 + b^2 = c^2 \]
2-110 a) After seeing the demonstration in class of
the Dynamic Geometry tool, where you were
convinced? Why or why not?

\[a^2 + b^2 = c^2\]

\[(\text{Leg } 1)^2 + (\text{Leg } 2)^2 = (\text{Hypotenuse})^2\]

Note: Hypotenuse = c

is opposite the
greatest angle, which
leg is \#1 or \#2 (and)
does not matter.

2-111 1) \[y^2 + 5^2 = x^2\]
\[16 + 25 = x^2\]
\[x^2 = 41\]
\[x = \sqrt{41}\]
\[x \approx 6.4\]

2) \[y^2 + 7^2 = 11^2\]
\[y^2 + 49 = 121\]
\[-49 -49\]
\[y^2 = 72\]
\[y = \sqrt{72}\]
\[y \approx 8.49\]

5) \[a^2 + b^2 = 15^2\]
\[a^2 + 36 = 225\]
\[a^2 = 189\]
\[a = \sqrt{189}\]
\[a \approx 13.75\]

\[P \approx 13.75 + 13.75 + 6 + 6\]
\[P \approx 39.5\]

\[A \approx 13.75 \times 6\]
\[A \approx 82.5\]

\[AC^2 = 3^2 + 7^2\]
\[AC^2 = 9 + 49\]
\[AC^2 = 58\]
\[AC = \sqrt{58} \approx 7.62\]
2-112

Big Horn Plate

\[ 7^2 + 2^2 = C^2 \]
\[ 49 + 4 = C^2 \]
\[ C^2 = 53 \]
\[ C = \sqrt{53} \approx 7.28 \text{ miles} \]

2-113 Check Point #2 If you have trouble with time, refer to
The notes in the back of your textbook or check point #2

\( a \) \( y = 3x + 11 \)
\[ x + y = 3 \]
\[ x + 3x + 11 = 3 \]
\[ 4x + 11 = 3 \]
\[ 4x = -8 \]
\[ x = -2 \]
So, \( x = -2 \)
\[ y = 3(-2) + 11 \]
\[ y = -6 + 11 = 5 \]
\[ (-2, 5) \]

\( b \) \( y = \frac{2x+3}{x-y} = -4 \)
\[ x - y = -4 \]
\[ x - (2x + 3) = -4 \]
\[ -x - 3 = -4 \]
\[ -x = 1 \]
So, \( x = -1 \)
\[ y = 2(-1) + 3 \]
\[ y = 1 \]
\[ (1, 1) \]

\( c \) \( x + 2y = 16 \)
\[ x + y = 2 \Rightarrow y = 2 - x \]
\[ y = 2 - x \]
\[ x + 2(2 - x) = 16 \]
\[ x + 4 - 2x = 16 \]
\[ -x = 12 \]
\[ x = -12 \]
So, \( y = 2 - x \)
\[ y = 2 - (-12) \]
\[ y = 14 \]
\[ (-12, 14) \]

\( d \) \( 2x + 3y = 10 \Rightarrow \frac{3y}{2} = 10 - \frac{2x}{3} \)
\[ 3x - y = -2 \]
\[ 3x - \left(\frac{12}{3} \cdot \frac{-2}{3} x\right) = -2 \]
\[ 3x - 4x - 6x = -2 \]
\[ 8\left(\frac{3x}{2}\right) - 4y = 12 \]
\[ 9x - 4y + 8y = 6 \]
\[ 17x - 4y = 40 \]
\[ 13x = 34 \]
\[ 17 \]
So, \( y = -2 \)
\[ x = 2 \]
\[ (2, -2) \]
2.114) There are 8 shapes in $\mathbb{R}^2$, shape budget, so all probabilities are out of 8.

i.e. \[ \text{# of shapes that meet criteria} \]

(a) 7 shapes have at least 2 sides congruent, so,
\[ P(\text{at least 2 sides}) = \frac{7}{8} \]
(b) 3 shapes have two pairs of parallel sides, so,
\[ P(\text{two pairs of parallel sides}) = \frac{3}{8} \]
(c) 5 shapes have at least 1 pair of parallel sides, so,
\[ P(\text{at least 1 pair of parallel sides}) = \frac{5}{8} \]

2-115 13 $\triangle$ 4
\[ A = \frac{1}{2} (4)(b_1 + b_2) \]
\[ = \frac{1}{2} (12)(12 + 23) \]
\[ = 6 (35) \]
\[ = 210 \text{ sq units} \]

 Solve for $x$ using Pythagorean theorem. Then, use the formula for trapezoid, being careful that the bottom base is 5 + 18 = 23.

2-116 a) Trapezoid sum theorem,
\[ (2x + 3) + (3x - 2) + (2x - 5) = 180 \]
\[ 6x + 2 = 180 \]
\[ 6x = 178 \]
\[ x = \frac{178}{6} \]
\[ x = 29.5 \]

(b) Vertical sides cannot be congruent. $Ls = 6x - 2x = 4x + 18$
\[ 2x = 46 \]
\[ x = 23 \]

2-117) 8" 9 13"
minimum is 13 - 8 = 5
maximum is 8 + 13 = 21
\[ s" < \text{third side} < 21" \]

4.9 4