b) Yes, the two triangles are similar by AA ~ (it, LS &)
No reflection makes two = LS.

c) \[ \frac{162}{152} = \frac{200}{x} \]
\[ 162x = 200 \times (152) \]
\[ x = \frac{162 \times 200}{152} \]
\[ x \approx 187.7 \text{ cm} \]

3-106 a)

5) \[ \frac{4}{12} = \frac{x}{942} \]
\[ 12x = 4 \times 942 \]
\[ x = \frac{4 \times 942}{12} \]
\[ x = 314 \]
But you must add the 2 ft.
So, Big Ben is 316 ft. tall.

3-112

\[ 15^2 + x^2 = 20^2 \]
\[ x^2 = 20^2 - 15^2 \]
\[ x^2 = 400 - 225 \]
\[ x^2 = 175 \]
\[ x = \sqrt{175} \]
\[ x \approx 13.2 \text{ miles} \]

Matt lives about 13.2 miles from Simone.
3-108) \[ 3 \cdot 180 - 43 = 137^\circ \]
\[ x = 137^\circ \]
Solve for \( x \) if it is a corresponding angle to 137°, which is 137° since it is supplementary to 43°.

Since \( \angle y + \angle z \) sum to 180°, \[ 61^\circ + y + 43^\circ = 180^\circ \]
\[ y + 104^\circ = 180^\circ \]
\[ y = 76^\circ \]

3-109) \[ A = \frac{1}{2} \times 5 \times 10 \]
\[ \frac{25}{5} = 5 \cdot h \]
\[ h = 5 \text{ units} \]

\[ x^2 = 6^2 + 5^2 \]
\[ x^2 = 36 + 25 \]
\[ x^2 = 61 \]
\[ x = \sqrt{61} \]

\[ P = 10 + \sqrt{61} + \sqrt{41} \approx 10 + 7.81 + 6.4 \approx 24.21 \]

3-110, 111, on page 4
3-112, on page 1

3-113) \( \overline{ABCD} \) \[ \overrightarrow{\text{ux}} \]
\[ \overrightarrow{\text{yz}} \]

\[ AB = \overline{wx} \]
\[ BC = \overline{xy} \]
\[ CD = \overline{yz} \]
\[ AD = \overline{wz} \]
b) Yes, these ratios must be equal because they correspond to each other in the similar triangles.
\[
\frac{DB}{AB} = \frac{AC}{BC} \quad \frac{DC}{AC} = \frac{BC}{AC}
\]

\[
AB^2 = (DB)(CB) \quad AC^2 = (BC)(DC)
\]

\[
AB^2 + AC^2 = (DB)(CB) + (BC)(DC)
\]

So, \[(BC)(BD + CD) = (BC)(BC) = (BC)^2\]

Since \[(AB)^2 + (AC)^2\] and \[(BC)^2\] are both equal to \(BD + CD\), they must equal each other. This is called the transitive property.

\[
(AB)^2 + (AC)^2 = (BD)(BC) + (BC) + (CD)
\]

\[
(BC)^2 = (BD)(BC) + (BC)(CD)
\]

So, \[(AB)^2 + (AC)^2 = (BC)^2\]

Therefore, the Pythagorean Theorem is proven!
3-110  a) \[ \frac{28}{5} - \frac{x}{2} = \frac{28}{10} \]
\[ 2x = 5 \cdot \frac{28}{2} \]
\[ x = 70 \]

No more than 70 animals in the bin.

b) \[ \frac{13 + 17}{22 + 8 + 13 + 15 + 17} = \frac{30}{75} = 40\% \]
The probability of getting a sea animal is 40%.

c) \[ \frac{3}{x} = 5\% \Rightarrow \frac{3}{x} = \frac{5}{100} \]
\[ 5x = 3 \cdot \frac{100}{5} \]
\[ x = 60 \]

3-111  a) \[ m = \frac{\Delta y}{\Delta x} = \frac{-4}{8} = -\frac{1}{2} \]
\[ b = 4 \]
\[ y = mx + b \]
\[ y = -\frac{1}{2}x + 4 \]

b) A line has slope \( m = \frac{3}{2} \) or \( m = 2 \)
So the equation is \( y = 2x + b \)
To find \( b \), plug the point \((-1, 3)\) into the equation:
\[ -3 = 2(-1) + b \]
\[ -3 = -2 + b \]
\[ b = 1 \]
So the equation is \( y = 2x + 1 \)

C) Find the slope by graphing on the equation:
\[ m = \frac{y_2 - y_1}{x_2 - x_1} \]
\[ m = \frac{-1 - 3}{-4 - 2} = \frac{-4}{-6} = \frac{2}{3} \]
So \( m = \frac{2}{3} \)

So the equation is \( y = \frac{2}{3}x + b \)
To find \( b \), plug one point in to find \( b \):
\[ y = \frac{2}{3}x + b \]
\[ 1 = \frac{2}{3}(-1) + b \]
\[ b = \frac{2}{3} \]

D) \( C = 15 + \frac{7}{6} \times 7 \Rightarrow C = 15 + \frac{7}{6} \times 7 \Rightarrow C = 8 + 7 \)

If you can't successfully do 3-111, you need to seek extra help!