1. Let \( x \) be the number then \( x - x / 2 = 2x + 3 \Rightarrow -3x / 2 = 3 \Rightarrow x = 3 \cdot -2 / 3 = -2 \).

2. \((5 + 23) / 2 = 14\), \((14 - 11) / 3 = 1\), \(6 \cdot 1 - 1 = 5\)

3. The line of slope 8 which passes through the point \((3.5, 39.2)\) has equation 
   \[
y - 39.2 = 8(x - 3.5) = 8x - 28 \Rightarrow y = 8x + 11.2.\]
   So the \( y \)-intercept is 11.2.

4. \(a = 0.8c \Rightarrow c = a / 0.8 = 1.25a\), so \(b = 0.62c = 0.62 \cdot 1.25a = 0.775a\), hence \(b\) is 77.5% of \(a\).

5. \(\left(\frac{1}{x} + \frac{1}{x^2}\right) ÷ \left(\frac{1}{x^3} + \frac{1}{x^4}\right) = \frac{x + 1}{x^2} ÷ \frac{x + 1}{x^4} \Rightarrow \frac{x + 1}{x^2} \cdot \frac{x^4}{x + 1} = x^2\).

6. The longest pole must go from corner to corner of the box and has length equal to the diagonal of the box. The diagonal of the 2 x 3 side is \(\sqrt{2^2 + 3^2} = \sqrt{13}\) inches and the diagonal of the box is \(\sqrt{15^2 + 6^2} = \sqrt{49} = 7\) inches.

7. A floor that is 12 feet by 15 feet would require \((144 / 9)(180 / 9) = 16 \cdot 20 = 320\) tiles measuring 9 inches on each side.

8. Let \(b\) be the base then we have \(\frac{b^2 + 3}{4} = 2b + 9\Rightarrow b^2 + 3 = 8b + 36 \Rightarrow b^2 - 8b - 33 = 0\) 
   \(\Rightarrow (b - 11)(b + 3) = 0, \text{ so } b = 11 \text{ or } b = -3. \text{ Since the base must be positive, } b = 11.\)

9. Let \(x\) be the weight of a brick, then \(x = \frac{3}{5} \cdot x + \frac{4}{5} \Rightarrow \frac{2}{5} \cdot x = \frac{4}{5} \Rightarrow x = 2\) pounds.

10. Let \(x\) be the height of the rectangle, then \(2x = \pi \cdot 1^2 = \pi \Rightarrow x = \pi / 2\). The height of the rectangle is \(\pi / 2\).