8.1 - Systems of Equations

Review problems

1. A box has the volume of 12 cubic inches. If the width of the box is 4 in, and the length is 9 in, what is its height?

2. A circle has a circumference of $40\pi$ in. Find the radius and area of this circle.

3. Find the dimensions of a rectangle whose length is double the width, and the perimeter is 40 in.

4. A can has a volume of 64 cubic inches and a radius of $1\frac{1}{3}$ inches. Find the height of the can.

Basic knowledge

5. Solve the given system of equations:
   \[ \begin{align*}
   x + 2y &= 1 \\
   3x - y &= 17 
   \end{align*} \]

6. A small coffee mug costs $3, and a large mug costs $5. Alice bought a total of 65 mugs for which she paid $285. How many large mugs and how many small mugs did she buy?

Intermediate

7. Solve the following system of equations:
   \[ \begin{align*}
   4x + 2y &= 7 \\
   x - y &= -\frac{11}{4} 
   \end{align*} \]

8. I have 3 more quarters than nickles in my piggy bank. How many quarters and how many nickles do I have if their total value is $3.75?

Advanced

9. Solve the system (hint: substitute $u = \frac{1}{x}$ and $v = \frac{1}{y}$):
   \[ \begin{align*}
   2x + 3y &= 7 \\
   7x - 4y &= 9 \\
   7x - 4y &= -4 
   \end{align*} \]

10. Find the equation of a parabola of the form $y = ax^2 + bx + c$ whose graph passes through points (1, 0), (2, 0) and (0, 4).