1.1 - Linear Equations

Review problems

1. Operations on fractions.

Evaluate and simplify:

(a) \(\frac{2}{9} - \frac{5}{12}\)  
(b) \(\frac{6}{25} + \frac{12}{20}\)  
(c) \(\frac{1}{3} - \frac{1}{4}\)

Basic knowledge

2. Solve for \(x\):

(a) 3(x - 2) + 2(3 - x) = 1  
(b) \(\frac{2-x}{3} + \frac{x}{6} = \frac{3x+1}{4}\)  
(c) \(\frac{3x}{x+2} - 1 = \frac{1}{3x+6}\)

3. A circle has a circumference of \(40\pi\) in. Find the radius and area of this circle.

4. Find the dimensions of a rectangle whose length is double the width, and the perimeter is 60in.

5. Find the surface area and the volume of a box with dimensions 3 inches by 4 inches by 10 inches.

6. Bob invests $15,000, some is stocks and the rest in bonds. If he invests three times as much in stocks as in bonds, how much does he invest in each?

Intermediate knowledge

7. Alice and Bob earned together $105,000 last year. If Alice earned 75% of what Bob earned, how much did each earn?

8. If \(P\) dollars are invested at a simple interest rate \(r\) (in decimals), the amount \(A\) that will be available after \(t\) years is \(A = P + Prt\).

(a) If $200 are invested at the rate of 5%, how much money will be collected after 10 years?
(b) How much money was invested at the rate 10% if after 4 years, $700 was collected?
(c) At what rate was $100 invested if $400 was collected after 6 years?

9. A cylindrical can has a volume of 64 cubic inches and a radius of \(1\frac{1}{3}\) inches. Find the height of the can.

Advanced knowledge

10. Solve for \(x\) assuming that \(a\) and \(b\) are nonzero real numbers:

(a) \(ax = \frac{a+bx}{a-b}\)  
(b) \(a(a+x) = b^2 - bx\)

11. Rick bought a stock at a certain price. The price first decreased 10% and then increased 8%. Now the price of this stock is $487. How much did Rick pay initially for this stock?