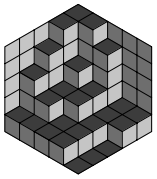


The Art of Problem Solving

Pre-Test

Introduction to Algebra

If you've mastered arithmetic well enough to solve the problems below, you are ready for the Art of Problem Solving's *Introduction to Algebra* book.

Answers to these problems are on the following page. **Do not use a calculator.**

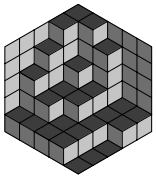
1. **Order of operations**. Evaluate:
   (a) $15 + 6 \cdot 7$
   (b) $(3 - 4) - (-5 + 1)$
   (c) $3 \cdot (6 - 8)$

2. **Operations with radicals**. Simplify:
   (a) $\sqrt{72} - \sqrt{50}$
   (b) $\sqrt{20} \cdot \sqrt{45}$
   (c) $\frac{\sqrt{32}}{\sqrt{8}}$

3. **Solving linear equations**. Solve these equations:
   (a) $31x + 24 = 365$
   (b) $7n - 4 = 2n + 16$
   (c) $3(10 + y) = 81$

4. **Working with variables**.
   (a) Expand the product $9(3x + 7)$.
   (b) Simplify: $7a - 5b + 3(6a + b)$.
   (c) Simplify: $a - (-7a - 3)$.

5. **Fractions, decimals, and percents**.
   (a) Convert to a fraction: .6144
   (b) Convert to a decimal: 17/40
   (c) 17 is what percent of 20?
   (d) What is $\frac{9}{5} - \frac{4}{3}$?
   (e) What is $\frac{3/6}{2/5}$ in simplest form?



The Art of Problem Solving
Pre-Test
Introduction to Algebra

Answers

1.
(a) 57
(b) 3
(c) -6

2.
(a) $\sqrt{2}$
(b) 30
(c) 2

3.
(a) $x = 11$
(b) $n = 4$
(c) $y = 17$

4.
(a) $27x + 63$
(b) $25a - 2b$
(c) $8a + 3$

5.
(a) 384/625
(b) .425
(c) 85%
(d) 7/15
(e) 5/4