

Math 101, Littlefield

Key for Homework “Solving Equations (First Set)”

Solve the following equations:

1. $d = rt$ for t (distance/rate/time)

$$t = \frac{d}{r}$$

2. $A = bh$ for b (area of a parallelogram)

$$b = \frac{A}{h}$$

3. $P = a + b + c$ for b (perimeter & sides of a triangle)

$$b = P - a - c \text{ or } b = P - (a + c)$$

4. $A = \frac{1}{2}bh$ for h (area of a triangle)

$$2A = bh$$

$$h = \frac{2A}{b} \text{ or } h = \frac{A}{\frac{1}{2}b}$$

5. $S = 2\pi rh + 2\pi r^2$ for h (surface area of a right circular cylinder)

$$S - 2\pi r^2 = 2\pi rh$$

$$\frac{S - 2\pi r^2}{2\pi r} = \frac{2\pi rh}{2\pi r}$$

$$h = \frac{S - 2\pi r^2}{2\pi r} = \frac{S}{2\pi r} - r$$

6. $A = \frac{1}{2}h(b + B)$ for B (area of a trapezoid)

$$2A = h(b + B)$$

$$2A = hb + hB$$

$$2A - hb = hB$$

$$B = \frac{2A - hb}{h} = \frac{2A}{h} - b$$

$$7. \quad r = \frac{4.3 - AiR}{i} \quad \text{for } A \text{ (electronics)}$$

$$ir = 4.3 - AiR$$

$$ir - 4.3 = -AiR$$

$$ir - 4.3 = (-iR)A$$

$$\frac{ir - 4.3}{(-iR)} = \frac{(-iR)A}{(-iR)}$$

$$A = \frac{ir - 4.3}{-iR} = \frac{4.3 - ir}{iR}$$

$$8. \quad \frac{1}{f} = \frac{1}{o} + \frac{1}{i} \quad \text{for } f \text{ (photography)}$$

$$foi \cdot \left(\frac{1}{f}\right) = foi \cdot \left(\frac{1}{o} + \frac{1}{i}\right)$$

$$\frac{foi}{f} = \frac{foi}{o} + \frac{foi}{i}$$

$$oi = fi + fo$$

$$oi = if + of$$

$$oi = (i + o)f$$

$$\frac{oi}{(i + o)} = \frac{(i + o)f}{(i + o)}$$

$$f = \frac{oi}{i + o} \quad \text{or} \quad f = \frac{oi}{o + i} \quad \text{or} \quad f = \frac{1}{\frac{1}{o} + \frac{1}{i}}$$

These are the most common forms of correct answers. Any equivalent forms are also acceptable as long as they meet the requirements for “solved”: 1) the specified variable must appear by itself on one side of the equation, and 2) the specified variable must not appear at all on the other side.