Routine Writing Equations Practice #2

*The purpose of this exercise is to **write equations**, which you can then solve.*

*There is **no** point using "guess and check" or working backwards using only numerical techniques, even if they are easy to do that way. That builds no skills for solving harder ones.*

Write equations for each situation, and then solve the equation to find the answer.

(Note: because the process is what is important, the answer is already given for the first three questions, to help focus on the process.)

1. Twelve bread rolls leave $4.40 change from a $20 note. How much is a bread roll? (answer = $1.30)

2. A 96 cm stick breaks into three pieces. The longest is 3 cm bigger than the shortest. The middle is 1.5 cm longer than the shortest. How long is the shortest? (answer = 30.5 cm)

3. Find the dimensions (that is, lengths) of the rectangle that has the long side 2.5 cm longer than the short side and a perimeter of 42 cm. (answer = 9.25 cm by 11.75 cm)

4. The price of a company's shares went up by 20% and then back down by 20%. If the price ended at $3.65 what did it start at?

5. The larger angles in a parallelogram are 34° bigger than the smaller angles. How large are the larger angles?

6. Kylie has 4 thin refill pads and 3 thick refill pads, with a total of 360 pages. If the thick pads have 50 pages more than the thin, how many pages does a thick pad have?

Answers: Routine Writing Equations Practice #2

The equations we are looking for are shown in bold. Other forms of the equation are acceptable, provided they give the right values, and obviously the letters chosen for the unknown(s) do not matter.

1. Let a roll cost = x. We are told: **$12x + 4.4 = 20$**

   $12x = 20 - 4.4$ $x = 15.6 \div 12$ **A roll costs $1.30**

   Note: writing $20 - 4.4 \div 12 = 1.3$ is **not** solving using an equation. In the context of an algebra test it is effectively worthless. (It is also wrong: $20 - 4.4 \div 12 = 19.63$)

2. Call them a, b, and c $a + b + c = 96$ But $b = a + 1.5$ and $c = a + 3$

   So **$a + (a + 1.5) + (a + 3) = 96$** $3a + 4.5 = 96$

   $3a = 96 - 4.5$ $a = 91.5 \div 3$ **The shortest is 30.5 cm**

3. 2 short sides + 2 long sides = 42. Let short side = x

   So long side = $x + 2.5$ So we get: **$x + (x + 2.5) + x + (x + 2.5) = 42$**

   $4x + 5 = 42$ $4x = 42 - 5$ $x = 37 \div 4 = 9.25$

   The long side is $x + 2.5 = 9.25 + 2.5$ **The rectangle is 9.25 by 11.75**

4. Call the start price x. After it went up by 20% it would end at $1.2x$

   When something falls by 20% it ends at 80% of where it started = 0.8

   $0.8 \times 1.2x = 3.65$ $0.96x = 3.65$ $x = 3.65 \div 0.96$

   The price started at $3.80

   Note: **not** $3.65. You **must** to do ones like this properly using algebra

5. Call the large angle x. Remember there are 360° in a parallelogram

   So **$x + (x - 34) + x + (x - 34) = 360$** $4x - 68 = 360$

   $4x = 360 + 68$. $x = 428 \div 4$ **The large angle is 107°**

6. 4 thin + 3 thick = 360 Let x be the pages in a thick pad, so $x - 50$ is a thin

   $4(x - 50) + 3x = 360$ $4x - 200 + 3x = 360$

   $7x = 360 + 200$ $x = 560 \div 7$ **A thick pad is 80 pages**