

Answer on Question #82412 – Math – Algebra

Question

Andy and Emily each go to a hardware store to buy wire. The table shows the cost y in dollars for x inches of the wire they need. Andy needs 25 feet of the wire. Emily needs 14 yards of the wire. How much will each of them spend for wire?

Cost of Wire

Length in Inches (x)	Cost in Dollars (y)
100	5.00
145	7.25
150	7.50
185	9.25

How much will Emily spend for her wire?

Solution

1 foot = 12 inches

1 yard = 3 feet = 36 inches

$$m = \frac{5}{100} \text{ (dollar/inch)}, k = \frac{7.25}{145} \text{ (dollar/inch)}, n = \frac{7.50}{150} \text{ (dollar/inch)},$$
$$p = \frac{9.25}{185} \text{ (dollar/inch)}$$

Andy needs 25 feet of the wire

$25(12 \text{ inches}) = 300 \text{ inches}$

$$300 \left(\frac{5}{100} \right) = 15 \text{ (dollars)}$$

Andy will spend \$15 for her wire.

Emily needs 14 yards of the wire

$14(36 \text{ inches}) = 504 \text{ inches}$

$$100a + 145b + 150c + 185d \geq 504$$

$$6(100) = 600$$

$$4(100) + 145 = 545$$

$$3(100) + 2(145) = 590$$

$$100 + 3(145) = 535$$

$$2(145) + 2(150) = 590$$

$$100 \left(\frac{5}{100} \right) + 3(145) \left(\frac{7.25}{145} \right) = 26.75 \text{ (dollars)}$$

$$504 \left(\frac{5}{100} \right) = 25.20 \text{ (dollars)}$$

Emily will spend \$26.75 for her wire.

If she can cut the wire, then Emily will spend \$25.20 for her wire.

Answer: Andy will spend \$15 for her wire. Emily will spend \$26.75 for her wire.