

1. Several students decide to start a T-shirt company. After initial expenses of \$375, they purchase each T-shirt wholesale for \$4.25. They sell each T-shirt for \$15.00. How many T-shirts must they sell to break even?

Cost \$375 one time  
\$4.25 per t-shirt  
Income \$15.00 per t-shirt

35 t-shirts need to  
be sold to break  
even

$$\begin{aligned} \text{Cost} &= 4.25x + 375 \\ \text{Income} &= 15.00x \\ 4.25x + 375 &= 15.00x \\ -4.25x & \quad -4.25x \\ \hline 375 &= 10.75x \\ \frac{375}{10.75} &= \frac{10.75x}{10.75} \\ 34.88 &= x \end{aligned}$$

2. Suppose you are starting an office-cleaning service. You have spent \$317 on equipment. To clean an office, you use \$5.30 worth of supplies. You charge \$22.50 per office. How many offices must you clean to break even?

Cost \$317 one time  
\$5.30 each cleaning  
Income \$22.50 each cleaning

19 offices need to be  
cleaned in order to  
break even

$$\begin{aligned} \text{Cost} &= 5.30x + 317 \\ \text{Income} &= 22.50x \\ 22.50x &= 5.30x + 317 \\ -5.30x & \quad -5.30x \\ \hline 17.20x &= 317 \\ \frac{17.20x}{17.20} &= \frac{317}{17.20} \\ x &= 18.43 \end{aligned}$$

3. Suppose you invest \$800 in equipment to put pictures on T-shirts. You buy each T-shirt for \$5.50. After you have placed the picture on a shirt, you sell it for \$21.50. How many T-shirts must you sell to break even?

Cost \$800 one time  
\$5.50 per t-shirt.  
Income \$21.50 per t-shirt

50 t-shirts need to  
be sold in order to  
break even

$$\begin{aligned} \text{Cost} &= 5.50x + 800 \\ \text{Income} &= 21.50x \\ 21.50x &= 5.50x + 800 \\ -5.50x & \quad -5.50x \\ \hline 16x &= 800 \\ \frac{16x}{16} &= \frac{800}{16} \\ x &= 50 \end{aligned}$$