



Word Problems that Result in Linear Equations



Let's do it together!

The cost to purchase a song from iTunes is \$0.99 per song. To purchase a song from Napster, you must be a member. The Napster membership fee is \$10. In addition, each purchase song costs \$0.89. How many downloaded songs (d), must be purchase for the money price of Napster to be the same as iTunes?

$$\cancel{\square} \circ \boxed{.99d} = \boxed{10} \oplus \boxed{.89d}$$

↑
Variable

↓

iTunes
 $.99d$
 Nap
 $10 + .89d$

$$\begin{array}{r} .99d = 10 + .89d \\ - .89d \quad - .89d \\ \hline .10d = 10 \\ \hline .10 \quad .10 \\ \hline d = 100 \end{array} = 100 \text{ songs}$$

Some friends want to go see a movie that is showing at two different theaters in town. They also plan to share three tubs of popcorn during the movie.



	Theater A	Theater B
Ticket Price	\$14.50	\$13.00
Popcorn	\$5.75	\$6.75

a) Write an expression for each movie theater to calculate costs.

$\$60.75 \leftarrow$ Theater A: $3(5.75) + 14.50x$
 $\$59.25$ Theater B: $3(6.75) + 13.00x$

b) For what situation would the total cost at each theater be exactly the same? Justify your answer.

$$\begin{array}{r}
 17.25 + 14.50x = 20.25 + 13.00x \\
 -13.00x \qquad \qquad \qquad -13.00x \\
 \hline
 17.25 + 1.5x = 20.25 \\
 -17.25 \qquad \qquad \qquad -17.25 \\
 \hline
 1.5x = 3 \\
 \frac{1.5x}{1.5} = \frac{3}{1.5} \\
 x = 2
 \end{array}$$

equals

c) Which movie theater should the friends choose? Explain.

Cameron pays \$0.95 per song with his current music service. A new music download service charges \$0.89 per song with just a \$12 joining fee. Should Cameron switch to the new service?

When will they be the same?

HINTS

- > Write an equation to represent the cost for any number of songs, s .
- > Solve the equation to find the number of songs at which the cost for each option will be the same.
- > Interpret your solution.

old-
new-



Tim is choosing between two cell phone plans that offer the same amount of free minutes. At&t plan charges \$39.99 per month with additional minutes costing \$0.45. Verizon's plan costs \$44.99 with additional minutes at \$0.40. How many additional minutes, m , will it take for the two plans to cost the same?

a) Write an expression for AT&T

b) Write an expression for verizon

c) How many additional minutes, m , will it take for the two plans to cost the same?



Suppose a video store charges nonmembers \$4 to rent each video. A store membership costs \$21 and members pay only \$2.50 to rent each video. For what number of videos is the cost the same?



One cell phone company plan costs \$39.95 per month. The first 500 minutes of usage are free. Each minute after that costs \$0.35. If Sarah's cell phone bill was \$69.70, how many minutes over her allotted 500 did she use?



Warm Up:

Solve the proportion.

$$\frac{n}{3} = \frac{15}{18}$$



$$n = \underline{\quad}$$