

Word problems with variables on both sides

Name:

**For each word problem, write an algebraic equation using the given variable. Solve showing algebraic steps.**

1. Container A and container B have leaks. Container A has 800 ml of water, and is leaking 6 ml per minute. Container B has 1000 ml, and is leaking 10 ml per minute. How many minutes,  $m$ , will it take for the two containers to have the same amount of water?
2. Tim is choosing between two cell phone plans that offer the same amount of free minutes. Cingular's 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,  $a$ , will it take for the two plans to cost the same?
3. 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 purchased song costs \$0.89. How many downloaded songs,  $d$ , must be purchased for the monthly price of Napster to be the same as iTunes?
4. Container A has 200 L of water, and is being filled at a rate of 6 liters per minute. Container B has 500 L of water, and is being drained at 6 liters per minute. How many minutes,  $m$ , will it take for the two containers to have the same amount of water?
5. UPS charges \$7 for the first pound, and \$0.20 for each additional pound. FedEx charges \$5 for the first pound and \$0.30 for each additional pound. How many pounds,  $p$ , will it take for UPS and FedEx to cost the same?
6. A twelve inch candle and an 18 inch candle are lit at 6pm. The 12-in. candle burns 0.5 inches every hour. The 18 inch candle burns two inches every hour. At what time will the two candles be the same height? Let  $h$  represent the number of hours.

7. Bill weighs 120 pounds and is gaining ten pounds each month. Phil weighs 150 pounds and is gaining 4 pounds each month. How many months,  $m$ , will it take for Bill to weigh the same as Phil?
8. A full 355 mL can of Coke is leaking at a rate of 5 mL per minute into an empty can. How long will it take for the two cans to have the same amount,  $a$ , of Coke?
9. On Saturday, you bowl at Mar Vista Bowl, where renting shoes costs \$2 and each game bowled is \$3.50. On Sunday, you bowl at Pinz where the shoe rental is \$5 and each game bowled is \$3.25. If you spent the same amount each day, how many games,  $g$ , were bowled?
10. At one store a trophy costs \$12.50. Engraving costs \$0.40 per letter. At another store, the same trophy costs \$14.75. Engraving costs \$0.25. How many letters,  $e$ , must be engraved for the costs to be the same?
11. You are seeking to be emancipated from your parents. You are looking for an apartment. There are two final choices. Apartment A has a \$1000 security deposit and costs \$1200 each month. Apartment B has a \$1500 and costs \$1175 each month. How many months,  $m$ , will it take for the costs to be the same?
12. Lenny makes \$55,000 and is getting annual raises of \$2,500. Karl makes \$62,000, with annual raises of \$2,000. How many years,  $y$ , will it take for Lenny and Karl to make the same salary?
13. In 1987, 34.7 million households owned a dog, and 27.7 million owned a cat. Since then, dog ownership has decreased by 0.025 million households per year, and cat ownership has increased by 0.375 million households per year. How many years,  $y$ , will it take for them to be equal?
14. In 2000, Ohio's population was 11.4 million and increasing by 0.5 million each year. Michigan's population was 9.9 million, increasing by 0.6 million each year. When will the two states have the same population? Let  $y$  represent the number of years.