



One-Variable Word Problems

A. All these problems can be solved using one variable.

1. Mike is 11; his mom is 34. In how many years will Mike's mother be twice as old as he is?
2. Mark's age next year will be three times Jim's age from two years ago. If the sum of their ages now is 21, how old are they?
3. Karen is 9 years older than Jan. Karen's age in 5 years will be twice Jan's age in 4 years. How old are they now?
4. Stan has a collection of coins worth \$4.40. He has one more quarter than he has dimes, and he has twice as many quarters as nickels. How many of each coin does Stan have?
5. The Ski Club made Nanaimo bars at a cost of 55¢ each. They sold all but 3 at 75¢ each. If the profit was \$4.75, how many Nanaimo bars did they make?
6. Mary has 9 more dimes than Kim has quarters. If Mary gave Kim 5 of her dimes, Kim would have \$1.00 more than Mary. How much money do they have altogether?
7. Peter walked from his house to the store at 6 km/h. He got a ride home at 60 km/h. His total travelling time was 1 hour. How long did it take Peter to walk, and how far away is the store?
8. Bill and Gary leave the same point travelling in opposite directions. Bill drives 20 km/h faster than Gary. After 2 hours, they're 280 km apart. Find each driver's speed.
9. Jeannie begins cycling west at 20 km/h at 1:00 pm. A half-hour later, Kathy, cycling at 25 km/h, chases after Jeannie. At what time will Kathy catch Jeannie?
10. A painting is 5 cm longer than it is wide. If a border 2.5 cm wide is added to the painting, the area of the border is 200 cm². What are the dimensions of the painting?
11. Two-thirds of the coins in a piggy bank are quarters. The rest are dimes. The value of the coins is \$3.60. How many dimes are there?
12. The sum of the digits of a three-digit number is 19. The hundreds digit is 2 less than the tens digit and 14 less than two times the units digit. Find the number.



13. 15,000 people went to the Canucks-Oilers game. 87% of the people cheered for the Canucks. How many people cheered for the Oilers?
14. Half of a sum of money is invested at 8%, one-third at 9%, and the remainder at $7\frac{1}{2}\%$. If the annual interest income is \$74.25, how much was invested?
15. How many kilograms of a 25% salt solution must be added to 12 kg of a 10% salt solution to get a 15% salt solution?
16. A coffee shop sells Peruvian coffee beans at \$7.00 per kilogram and Colombian coffee beans at \$8.40 per kilogram. How much of each bean should be used to make 14 kg of a blend which costs \$7.80 per kilogram?
17. Mike can dig a grave in 4 hours. Bill can dig a grave in 3 hours. How long will it take them to dig a grave working together?
18. A faucet can fill a sink in 4 minutes. The drain can empty the sink in 5 minutes. If the faucet is turned on over an empty sink, while the drain is open, how long will it be before the sink overflows?

SOLUTIONS

- A. (1) $34 + t = 2(11 + t)$; $t = 12$
- (2) $(3J - 7) + J = 21$; $J = 7$, Mark is 14.
- (3) $(J + 9) + 5 = 2(J + 4)$; $J = 6$, Karen is 15.
- (4) $25q + 10(q - 1) + 5(\frac{1}{2}q) = 440$; $q = 12$, 11 dimes and 6 nickels
- (5) $75(b - 3) - 55b = 475$; $b = 35$
- (6) $10(q + 9) - 10 \cdot 5 + 100 = 25q + 10 \cdot 5$; $q = 6$; \$2.40
- (7) $\frac{d}{6} + \frac{d}{60} = 1$; $d = 5.4545\dots$ km, Peter walked for .9090... h or 54.54... min
- (8) $2(G + 20) + 2G = 280$; $G = 60$ km/h, Bill drove at 80 km/h.
- (9) $20(t + \frac{1}{2}) = 25t$; $t = 2$ hours, Kathy left at 1:30 pm, and caught Jeannie at 3:30 pm
- (10) $(w + 5)[(w + 5) + 5] - (w)(w + 5) = 200$; $w = 15$ cm, length = 20 cm
- (11) $10d + 25(2d) = 360$; $d = 6$,
- (12) $h + (h + 2) + (h + 14)/2 = 19$; $h = 4$, the number is 469.
- (13) $o = .13 \times 15,000$; $o = 1950$
- (14) $.08(\frac{1}{2}s) + .09(\frac{1}{3}s) + .075(\frac{1}{6}s) = 74.25$; $s = \$900$
- (15) $.25x + .10(12) = .15(x + 12)$; $x = 6$ kg
- (16) $7p + 8.4(14 - p) = 7.8 \times 14$; $p = 6$ kg of Peruvian, 8 kg of Colombian
- (17) $\frac{1}{4} + \frac{1}{3} = 1$; $t = \frac{12}{7} = 1.71$ h
- (18) $\frac{1}{4} - \frac{1}{5} = 1$; $t = 20$ minutes

