[06-12-18-8-NEM2]

Exercise 6.4

answers on p. 433

1. The sum of two numbers is 23. Twice the larger number is 4 more than 4 times the smaller. What are the numbers?

2. One of the acute angles of a right-angled triangle is 16° larger than the other. How many degrees are there in each of the acute angles?

3. A bottle and its contents cost 60 cents but the contents cost 18 cents more than the bottle. How much does the bottle cost?

4. Two books cost \$15 altogether. One costs \$1.50 more than the other. How much does each book cost?

5. The sum of two numbers is $\frac{53}{24}$ and the difference of the same two numbers is $\frac{13}{24}$. What are the numbers?

6. A two-digit number is smaller by 27 than the number with the digits reversed. The sum of the digits is 13. Find the number.

7. There are 10 more boys than girls in a class. If one more girl joins the class, there will be twice as many boys as there are girls. How many boys and how many girls are there in the class?

8. A rope was cut into two pieces so that one piece was 18 m longer than the other. That piece was also three times as long as the other. How long was each piece and how long was the original rope?

9. An angle is three times its supplement. Find the angle. (*Note:* Two angles which add up to 180° are supplements of each other.)

10. Twice the length of a rectangle is three times the width. The perimeter is 320 cm. Find the dimensions of the rectangle.

11. If 5 is added to both the numerator and the denominator of a certain fraction, the result is $\frac{4}{7}$. If 1 is subtracted from both the numerator and the denominator, the result is $\frac{2}{5}$. Find the fraction.

12. A motor boat can travel 45 km downstream in 2 h and 30 min; and 39 km upstream in 3 h and 15 min. What is the speed of the boat in still water? What is the speed of the current?

13. Six oranges and four apples cost \$3.20. One orange and five apples cost \$2.05. What are the costs of an apple and an orange?

14. I think of two numbers. The first number plus three times the second number is 1. The first minus three times the second is 19. Find the numbers.

15. Ali bought 12 pencils and 10 rulers for \$2.10. Paying the same price for each as Ali, I bought 20 pencils and 4 rulers for \$1.60. What were the prices of a pencil and a ruler?

16. In triangle ABC, $\hat{A}$ is 20°. The number of degrees in $\hat{B}$ is 10 more than 9 times the number of degrees in $\hat{C}$. Find $\hat{B}$ and $\hat{C}$.

17. A boy walked for 4 h and cycled for 3 h, covering a total distance of 74 km. Later he walked for 2 h and cycled for 4 h, covering 82 km. What were his speed of walking and his speed of cycling if his speeds in the two cases were constant?

18. A carpenter can make a cabinet in 30 h. If he works for 21 h at the normal rate of pay and 9 h at the overtime rate, he will be paid \$69. But if he works for 27 h at the normal rate and 3 h at the overtime rate, his earnings will be \$63. Find his normal and overtime rates of pay.

19. In decimal numerals, if 36 is added to a certain two-digit number, the result is the number with the digits reversed. The 'ones' digit is 1 more than twice the 'tens' digit. What is the number?

20. Two trains leave two different stations 300 km apart; the first starts at noon and the second at 12 15 h. Travelling on parallel tracks, they meet each other at 15 00 h. Each train travels at a constant speed, the one leaving at 12 15 h moves at 15 km/h faster than the other. What are their speeds?

21. The total mass of a mixture of two liquids is 2.4 kg and the total volume is 1 000 cm^3. If 1 cm^3 of one of the liquids weighs 2 g and 1 cm^3 of the other liquid weighs 3 g, what volume of each liquid is present? What mass of each liquid is present?

22. Four years ago, a man was $2\frac{1}{2}$ times as old as his son, but in five years' time, he will be only twice as old as his son. How old is the man now?

Exercise 6.4 *(p. 150)*

1. 16, 7
2. 37°, 53°
3. 21 cents
4. \$6.75, \$8.25
5. $\frac{33}{24}, \frac{20}{24}$ or $\frac{11}{8}, \frac{5}{6}$
6. 58
7. 18 boys, 8 girls
8. shorter piece: 9 m, long piece: 27 m, original piece: 36 m
9. 135°
10. length: 96 cm, width: 64 cm
11. $\frac{7}{16}$
12. speed of boat: 15 km/h, speed of current: 3 km/h
13. apple: 35 cents, orange: 30 cents
14. 10, –3
15. pencil: 5 cents, ruler: 15 cents
16. $\hat{B} = 145°$, $\hat{C} = 15°$
17. walking: 5 km/h, cycling: 18 km/h
18. normal rate: \$2 per h, overtime rate: \$3 per h
19. 37
20. 45 km/h, 60 km/h
21. 600 cm^3, 400 cm^3, 1 200 g, 1 200 g
22. 49 yrs old