7-7 Simple and Compound Interest

Find the simple interest to the nearest cent.

1. $1350 at 6% for 7 years

   ANSWER:
   $567

2. $240 at 8% for 9 months

   ANSWER:
   $14.40

3. $725 at 3.25% for 5 years

   ANSWER:
   $117.81

4. $3750 at 5.75% for 42 months

   ANSWER:
   $754.69

5. **LOANS** Mateo's sister paid off her student loan of $5000 in 3 years. If she made a payment of $152.35 each month, what was her simple interest rate for her loan?

   ANSWER:
   3.23%

Find the total amount in each account to the nearest cent if the interest is compounded annually.

6. $480 at 5% for 3 years

   ANSWER:
   $555.66

7. $515 at 11.8% for 2 years

   ANSWER:
   $643.71

8. $6525 at 6.25% for 4 years

   ANSWER:
   $8315.65

9. $2750 at 8.5% for 3 years

   ANSWER:
   $3512.55

7-7 Simple and Compound Interest

Find the simple interest to the nearest cent.

10. $275 at 7.5% for 4 years

    ANSWER:
    $82.50

11. $620 at 6.25% for 5 years

    ANSWER:
    $193.75

12. $734 at 12% for 3 months

    ANSWER:
    $22.02

13. $2020 at 8% for 18 months

    ANSWER:
    $242.40

14. $1200 at 6% for 36 months

    ANSWER:
    $216

15. $4380 at 10.5% for 2 years

    ANSWER:
    $919.80

16. **CARS** Thomas borrowed $4800 to buy a new car. He will be paying $96 each month for the next 60 months. Find the simple interest rate for his car loan.

    ANSWER:
    4%

Find the total amount in each account to the nearest cent if the interest is compounded annually.

17. $3850 at 5.25% for 2 years

    ANSWER:
    $4264.86

18. $4025 at 6.8% for 6 years

    ANSWER:
    $5973.01

19. $595 at 4.75% for 3 years

    ANSWER:
    $683.88

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20. $840 at 7% for 4 years

    ANSWER:
    $1101.07

21. $12,000 at 6.95% for 4 years

    ANSWER:
    $15,700.17

22. $8750 at 12.25% for 2 years

    ANSWER:
    $11,025.06

23. **CARS** Denise has a car loan of $8000. Over the course of the loan, she paid a total of $1680 in interest at a simple interest rate of 6%. How many months was the loan?

    ANSWER:
    42 months

24. **INVESTMENTS** A certificate of deposit has an annual simple interest rate of 5.25%. If $567 in interest is earned over a 6 year period, how much was invested?

    ANSWER:
    $1800

25. **FINANCIAL LITERACY** A bank offers the options shown for interest rates on their savings accounts. Which option will yield more money after 3 years with an initial deposit of $1500? Explain.

Kingman Bank		
Option	**Rate**	**Type of Interest**
A	6.25%	simple
B	5.75%	compounded annually

    ANSWER:
    option A; Sample answer: After 3 years, the interest earned with option A is $281.25. With option B, the interest earned is $273.91.

    Find the total amount in each account to the nearest cent if the interest is compounded twice a year.

26. $2500 at 6.75% for 1 year

    ANSWER:
    $2671.60

27. $14,750 at 5% for 1 year

    ANSWER:
    $15,496.72

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28. $3750 at 10.25% for 2 years

    ANSWER:
    $4579.90

29. $975 at 7.2% for 2 years

    ANSWER:
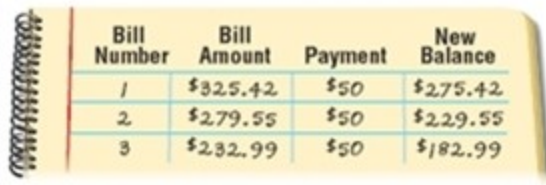 $1123.16

30. **COLLEGE** Mrs. Glover placed $15,000 in a certificate of deposit for 18 months for her children's college funds. Each month she makes $56.50 in interest. Find the annual simple interest rate for the certificate of deposit.

    ANSWER:
    4.52%

31. **CREDIT** Jameson received his first credit card bill for a total of $325.42. Each month he makes a $50 payment and the remaining balance is charged an interest rate of 1.5%. The register below shows his first three monthly bills. If he does not make any more charges, what will be the amount of the fifth bill? the seventh bill?

Bill Number	Bill Amount	Payment	New Balance
1	$325.42	$50	$275.42
2	$279.55	$50	$229.55
3	$232.99	$50	$182.99

    ANSWER:
    $137.77; $39.68

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32. **MULTIPLE REPRESENTATIONS** In this problem, you will compare simple and compound interest. Consider the following situation. Ben deposits $550 at a 6% simple interest rate and Anica deposits $550 at a 6% interest rate that is compounded annually.

   a. Tabular Copy and complete the table.

Total Interest Earned ($)		
Years	Ben	Anica
2	■	■
4	■	■
6	■	■
8	■	■
10	■	■

   b. Graphical Graph the data on the coordinate plane. Show the time in years on the *x*-axis and the account balance in dollars on the *y*-axis. Plot Ben's account balance in blue and Anica's account in red. Then connect the points.

   c. Analytical Compare the graphs of the two functions.

   ANSWER:

   a.

Total Interest Earned ($)		
Years	Ben	Anica
2	66 ■	67.98 ■
4	132 ■	144.36 ■
6	198 ■	230.18 ■
8	264 ■	326.61 ■
10	330 ■	434.96 ■

   b.

   c. Sample answer: The graph of Ben's interest is in a straight line. The graph of Anica's interest is increasing at a faster rate and is not in a straight line.

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33. **OPEN ENDED** Give a principal and interest rate where the amount of simple interest earned in four years would be $80. Justify your answer.

    ANSWER:

    Sample answer: $2000 at 1%. Using the simple interest formula $I = \$2000 \cdot 0.01 \cdot 4$ or $80

34. **REASONING** Kai-Yo deposits $500 into an account that earns 2% simple interest. Marcos deposits $250 into an account that earns 4% simple interest. How much money does each have after 10 years? Who will have more money over the long run? Explain your reasoning.

    ANSWER:

    Kai-Yo $600, Marcos: $350; Even though Kai-Yo and Marcos earn the same amount of interest after every year, Kai-Yo will always have $250 more than Marcos because that was the difference in the initial deposit.

35. **ERROR ANALYSIS** Sabino and Mya are finding the simple interest on a $2500 investment at a simple interest rate of 5.75% for 18 months. Is either of them correct? Explain your reasoning.

Sabino	Mya
$I = prt$	$I = prt$
$I = 2500 \cdot 0.0575 \cdot 18$	$I = 2500 \cdot 0.575 \cdot 1.5$
$I = \$2587.50$	$I = \$2156.25$

    ANSWER:

    no; Sabino did not convert the time to years and Mya did not change the percent to a decimal correctly.

36. **CHALLENGE** Determine the length of time it will take to double a principal of $100 if deposited into an account that earns 10% simple annual interest.

    ANSWER:

    10 years

37. **WRITING IN MATH** Compare simple and compound interest.

    ANSWER:

    Sample Answer: With simple interest, the amount of money earned will be the same each year because it is always applied to the initial amount. With compound interest, the amount of interest will increase each year because it is being applied to the new total after the interest is added each year.

38. A $500 certificate of deposit has a simple interest rate of 7.25%. What is the value of the certificate after 8 years?
    A. $290
    B. $500
    C. $790
    D. $2900

    ANSWER:

    C

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39. Beatriz borrowed $1500 for student loans. She will make 30 equal payments of $62.50 to pay off the loan. What is the simple interest rate for the loan?
    F. 4%
    G. 7%
    H. 8.5%
    J. 10%

    ANSWER:

    J

40. A savings account with $2250 has an interest rate of 5%. If the interest is compounded annually, how much will be in the account after 2 years?
    A. $230.63
    B. $337.50
    C. $2480.63
    D. $2587.50

    ANSWER:

    C

41. **EXTENDED RESPONSE** Which of the following plans will produce the greater earnings for an investment of $500 over 5 years? Explain.

    | Plan A | simple interest rate of 6.75% |
    | Plan B | rate of 6.5% compounded annually |

    ANSWER:

    6.5% compounded annually; Sample answer: The investment of $500 at a 6.75% simple interest will earn $168.75 and the investment at a 6.5% rate compounded annually will earn $185.04.

42. **ANIMALS** In 2000, there were 356 endangered species. Nine years later, 360 species were considered endangered. What was the percent of change?

    ANSWER:

    1.1%

    Solve each problem using the percent equation.
43. 12 is what percent of 400?

    ANSWER:

    3%

44. 30 is 60% of what number?

    ANSWER:

    50

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45. **MONEY** In a recent year, the number of $1 bills in circulation in the United States was about 7 billion.

    a. Suppose the number of $5 bills in circulation was 25% of the number of $1 bills. About how many $5 bills were in circulation?

    b. If the number of $10 bills was 20% of the number of $1 bills, about how many $10 bills were in circulation?

    ANSWER:

    a. $\dfrac{1}{4} \times 7$ or 1.75 billion

    b. $\dfrac{1}{5} \times 7$ or 1.4 billion

    ALGEBRA Find each product. Write in simplest form.

46. $\dfrac{2}{x} \bullet \dfrac{3x}{7}$

    ANSWER:

    $\dfrac{6}{7}$

47. $\dfrac{a}{b} \bullet \dfrac{5b}{c}$

    ANSWER:

    $\dfrac{5a}{c}$

48. $\dfrac{4t}{9r} \bullet \dfrac{18r}{t^2}$

    ANSWER:

    $\dfrac{8}{t}$

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49. **EXERCISE** The table shows the amount of time Craig spends jogging every day. He increases the time he jogs every week.

a. Write an equation to show the number of minutes spent jogging m for each week w.
b. How many minutes will Craig jog during week 9?

ANSWER:

a. $m = 8w - 1$
b. 71 min

Solve each problem.

50. Find 66% of 90.

ANSWER:

59.4

51. What is 0.2% of 735?

ANSWER:

1.47

52. Find 250% of 7000.

ANSWER:

17,500