7-7 Simple and Compound Interest

Find the simple interest to the nearest cent.
1. $1350 at 6% for 7 years
   \[ \text{ANSWER: } \$567 \]

2. $240 at 8% for 9 months
   \[ \text{ANSWER: } \$14.40 \]

3. $725 at 3.25% for 5 years
   \[ \text{ANSWER: } \$117.81 \]

4. $3750 at 5.75% for 42 months
   \[ \text{ANSWER: } \$754.69 \]

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?
   \[ \text{ANSWER: } 3.23\% \]

Find the total amount in each account to the nearest cent if the interest is compounded annually.
6. $480 at 5% for 3 years
   \[ \text{ANSWER: } \$555.66 \]

7. $515 at 11.8% for 2 years
   \[ \text{ANSWER: } \$643.71 \]

8. $6525 at 6.25% for 4 years
   \[ \text{ANSWER: } \$8315.65 \]

9. $2750 at 8.5% for 3 years
   \[ \text{ANSWER: } \$3512.55 \]
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
7-7 Simple and Compound Interest

20. $840 at 7% for 4 years
   \[\text{ANSWER:} \quad 1101.07\]

21. $12,000 at 6.95% for 4 years
   \[\text{ANSWER:} \quad 15,700.17\]

22. $8750 at 12.25% for 2 years
   \[\text{ANSWER:} \quad 11,025.06\]

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?
   \[\text{ANSWER:} \quad 42 \text{ months}\]

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?
   \[\text{ANSWER:} \quad 1800\]

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.

   \[
   \begin{array}{|c|c|c|}
   \hline
   \text{Option} & \text{Rate} & \text{Type of Interest} \\
   \hline
   A & 6.25\% & \text{simple} \\
   B & 5.75\% & \text{compounded annually} \\
   \hline
   \end{array}
   \]

   \[\text{ANSWER:} \quad \text{option A; Sample answer: After 3 years, the interest earned with option A is$281.25. With option B, the interest earned is$273.91.}\]

   \[\text{Find the total amount in each account to the nearest cent if the interest is compounded twice a year.}\]

26. $2500 at 6.75% for 1 year
   \[\text{ANSWER:} \quad 2671.60\]

27. $14,750 at 5% for 1 year
   \[\text{ANSWER:} \quad 15,496.72\]
7-7 Simple and Compound Interest

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?

<table>
<thead>
<tr>
<th>Bill Number</th>
<th>Bill Amount</th>
<th>Payment</th>
<th>New Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$325.42</td>
<td>$50</td>
<td>$275.42</td>
</tr>
<tr>
<td>2</td>
<td>$279.55</td>
<td>$50</td>
<td>$229.55</td>
</tr>
<tr>
<td>3</td>
<td>$232.99</td>
<td>$50</td>
<td>$182.99</td>
</tr>
</tbody>
</table>

**ANSWER:**
$137.77; $39.68
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.

<table>
<thead>
<tr>
<th>Years</th>
<th>Total Interest Earned ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>66</td>
</tr>
<tr>
<td>4</td>
<td>132</td>
</tr>
<tr>
<td>6</td>
<td>198</td>
</tr>
<tr>
<td>8</td>
<td>264</td>
</tr>
<tr>
<td>10</td>
<td>330</td>
</tr>
</tbody>
</table>

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.

- 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.
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 $I = P \cdot r \cdot t$, we find $I = 2000 \cdot 0.01 \cdot 4 = 80$

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 will have $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.

**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
7-7 Simple and Compound Interest

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.

<table>
<thead>
<tr>
<th>Plan</th>
<th>Interest Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>simple interest rate of 6.75%</td>
</tr>
<tr>
<td>B</td>
<td>rate of 6.5% compounded annually</td>
</tr>
</tbody>
</table>

   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
7-7 Simple and Compound Interest

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. \( \frac{1}{4} \times 7 \) or 1.75 billion
   b. \( \frac{1}{5} \times 7 \) or 1.4 billion

**ALGEBRA** Find each product. Write in simplest form.

46. \( \frac{2}{x} \cdot \frac{3x}{7} \)

   **ANSWER:**
   \( \frac{6}{7} \)

47. \( \frac{a}{b} \cdot \frac{5b}{c} \)

   **ANSWER:**
   \( \frac{5a}{c} \)

48. \( \frac{4t}{9r} \cdot \frac{18r}{t^2} \)

   **ANSWER:**
   \( \frac{8}{t} \)
7-7 Simple and Compound Interest

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

<table>
<thead>
<tr>
<th>Week</th>
<th>Time Jogging (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>15</td>
</tr>
<tr>
<td>3</td>
<td>23</td>
</tr>
<tr>
<td>4</td>
<td>31</td>
</tr>
<tr>
<td>5</td>
<td>39</td>
</tr>
</tbody>
</table>

a. Write an equation to show the number of minutes spent jogging $m$ for each week $w$.

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

b. How many minutes will Craig jog during week 9?

**ANSWER:**

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