

# Simple Interest

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Score: \_\_\_\_\_ / 24

## Q Quick Review

**Simple interest** is the extra money you earn (or owe) for using someone's money for a while. It is found with the formula  $I = Prt$ , where  $P$  is the **principal** (the starting amount),  $r$  is the yearly **interest rate** written as a *decimal*, and  $t$  is the **time** in years. To turn a percent into a decimal, divide by 100 — so 5% becomes 0.05. Once you have the interest  $I$ , the **total amount** is just  $A = P + I$ . The word "simple" means the interest is always figured on the *original* principal — it never piles up on itself.

◇ **Example:** Find the simple interest on a \$1,200 deposit at 4% per year for 3 years.

⇒ Let's line up the three ingredients first. The principal is  $P = \$1,200$ , the rate is  $4\% = 0.04$ , and the time is  $t = 3$  years. Now just multiply them together in the formula:  $I = Prt = 1200 \times 0.04 \times 3$ . Take it in steps —  $1200 \times 0.04 = 48$ , and  $48 \times 3 = 144$ . So the account earns \$144 in interest. If the question asked for the total, you would add it back on:  $\$1,200 + \$144 = \$1,344$ .

**Answer:**  $I = \$144$

## PRACTICE

Find the simple interest. Use  $I = Prt$  with the rate as a decimal.

- |   |       |  |       |
|---|-------|--|-------|
| 1. $P = \$500, r = 6\%, t = 2$ yr             | _____ | 11. $P = \$4,000, r = 4.5\%, t = 3$ yr           | _____ |
| 2. $P = \$800, r = 5\%, t = 3$ yr             | _____ | 12. $P = \$900, r = 5\%, t = 6$ yr               | _____ |
| 3. $P = \$1,000, r = 4\%, t = 1$ yr           | _____ | 13. $P = \$1,800, r = 3.5\%, t = 4$ yr           | _____ |
| 4. $P = \$1,500, r = 3\%, t = 4$ yr           | _____ | 14. $P = \$5,000, r = 3\%, t = 2$ yr             | _____ |
| 5. $P = \$2,000, r = 2.5\%, t = 2$ yr         | _____ | 15. $P = \$250, r = 10\%, t = 3$ yr              | _____ |
| 6. $P = \$600, r = 7\%, t = 5$ yr             | _____ | 16. $P = \$3,200, r = 5.25\%, t = 2$ yr          | _____ |
| 7. $P = \$2,500, r = 4\%, t = 3$ yr           | _____ | 17. Find $r$ : $I = \$90, P = \$600, t = 3$ yr   | _____ |
| 8. $P = \$1,200, r = 5.5\%, t = 2$ yr         | _____ | 18. Find $t$ : $I = \$240, P = \$2,000, r = 4\%$ | _____ |
| 9. $P = \$3,000, r = 6\%, t = \frac{1}{2}$ yr | _____ | 19. Find $P$ : $I = \$180, r = 6\%, t = 2$ yr    | _____ |
| 10. $P = \$750, r = 8\%, t = 2$ yr            | _____ | 20. Total $A$ : $P = \$1,500, r = 4\%, t = 5$ yr | _____ |

## ◆ Word Problems

21. Maya puts \$2,000 in a savings account that pays 6% simple interest per year. How much interest does she earn after 4 years, and what is her total balance? \_\_\_\_\_
22. Liam borrows \$1,000 from a credit union at 5% simple interest. He pays it all back after 2 years. How much does he repay in total? \_\_\_\_\_
23. A bond pays \$300 in simple interest over 5 years on a principal of \$1,500. What yearly interest rate does the bond pay? \_\_\_\_\_
24. Grandpa wants Nora's \$2,500 gift to grow to \$2,950 using an account that pays 6% simple interest. How many years must the money stay in the account? \_\_\_\_\_



## Answer Keys

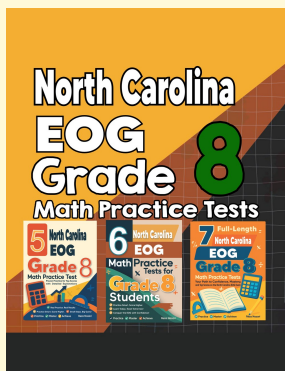
- |                 |                              |
|-----------------|------------------------------|
| 1. $I = \$60$   | 13. $I = \$252$              |
| 2. $I = \$120$  | 14. $I = \$300$              |
| 3. $I = \$40$   | 15. $I = \$75$               |
| 4. $I = \$180$  | 16. $I = \$336$              |
| 5. $I = \$100$  | 17. $r = 5\%$                |
| 6. $I = \$210$  | 18. $t = 3 \text{ yr}$       |
| 7. $I = \$300$  | 19. $P = \$1,500$            |
| 8. $I = \$132$  | 20. $A = \$1,800$            |
| 9. $I = \$90$   | 21. $I = \$480; A = \$2,480$ |
| 10. $I = \$120$ | 22. $\$1,100$                |
| 11. $I = \$540$ | 23. $r = 4\%$                |
| 12. $I = \$270$ | 24. $t = 3 \text{ years}$    |

### Step-by-Step Explanations

1. Change 6% to 0.06, then  $I = 500 \times 0.06 \times 2 = 60$ .
2. Here  $I = 800 \times 0.05 \times 3$ . Since  $800 \times 0.05 = 40$ , the interest is  $40 \times 3 = 120$ .
3. For one year,  $I = 1000 \times 0.04 \times 1 = 40$ .
4.  $1500 \times 0.03 = 45$  each year, and  $45 \times 4 = 180$ .
5.  $2.5\% = 0.025$ , so  $I = 2000 \times 0.025 \times 2 = 100$ .
6.  $600 \times 0.07 = 42$  per year, then  $42 \times 5 = 210$ .
7.  $2500 \times 0.04 = 100$ , and  $100 \times 3 = 300$ .
8.  $5.5\% = 0.055$ , so  $I = 1200 \times 0.055 \times 2 = 132$ .
9. Half a year means  $t = 0.5$ , so  $I = 3000 \times 0.06 \times 0.5 = 90$ .
10.  $750 \times 0.08 = 60$  each year, then  $60 \times 2 = 120$ .
11.  $4.5\% = 0.045$ , so  $I = 4000 \times 0.045 \times 3 = 540$ .
12.  $900 \times 0.05 = 45$  per year, and  $45 \times 6 = 270$ .
13.  $3.5\% = 0.035$ , so  $I = 1800 \times 0.035 \times 4 = 252$ .
14.  $5000 \times 0.03 = 150$  each year, then  $150 \times 2 = 300$ .
15.  $250 \times 0.10 = 25$  per year, and  $25 \times 3 = 75$ .
16.  $5.25\% = 0.0525$ , so  $I = 3200 \times 0.0525 \times 2 = 336$ .
17. Rearrange to  $r = \frac{I}{Pt} = \frac{90}{600 \times 3} = 0.05 = 5\%$ .
18. Solve  $t = \frac{I}{Pr} = \frac{240}{2000 \times 0.04} = 3$  years.
19. Solve  $P = \frac{I}{rt} = \frac{180}{0.06 \times 2} = 1500$ .
20. First  $I = 1500 \times 0.04 \times 5 = 300$ , then  $A = 1500 + 300 = 1800$ .
21. Use  $I = Prt = 2000 \times 0.06 \times 4 = 480$ . Then add the interest back to the principal:  $\$2,000 + \$480 = \$2,480$ .
22. The interest is  $I = 1000 \times 0.05 \times 2 = 100$ . He repays the principal plus the interest:  $\$1,000 + \$100 = \$1,100$ .
23. Rearrange  $I = Prt$  to get  $r = \frac{I}{Pt} = \frac{300}{1500 \times 5} = 0.04$ , which is 4%.
24. The interest needed is  $\$2,950 - \$2,500 = \$450$ . Then  $t = \frac{I}{Pr} = \frac{450}{2500 \times 0.06} = 3$  years.



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