Saving for College

Name: _____	Date: _____	Score: _____ / 24

Quick Review

Saving for a big goal like college works best when you start early and save *regularly*. If you set aside the same amount each period, the total saved is (amount per period) $\times$ (number of periods). To find how long it takes to reach a goal, divide: $\text{periods} = \dfrac{\text{goal}}{\text{amount per period}}$. Money in a savings account also **earns interest**, so it grows even faster — use $I = Prt$ for simple interest or $A = P(1 + r)^t$ for yearly compounding. The two big ideas are: small regular deposits add up, and *time* lets interest do part of the work for you.

◇ **Example:** Jamal saves $\$50$ every month for 4 years. How much will he have set aside?

⇒ First figure out how many deposits he makes. Four years at 12 months each is $4 \times 12 = 48$ months, so 48 deposits. Each deposit is $\$50$, so multiply: $48 \times \$50 = \$2{,}400$. That's the total he sets aside from his own pocket — and if the account also paid interest, he would end up with even more. Saving a little every month really does add up.

Answer: $\$2{,}400$

PRACTICE

Find the total saved, the time needed, or the amount with interest.

1. $\$25$/month $\times$ 12 months _____
2. $\$100$/month $\times$ 48 months _____
3. $\$2{,}000$ start + $\$500$/yr $\times$ 5 yr _____
4. $\$75$/week $\times$ 52 weeks _____
5. Goal $\$3{,}000$ at $\$250$/month: months needed _____
6. Goal $\$6{,}000$ at $\$200$/month: months needed _____
7. $\$1{,}000$ at 4% simple interest for 5 yr: total _____
8. $\$5{,}000$ at 5% compounded annually for 2 yr _____
9. $\$40$/month $\times$ 12 months $\times$ 10 yr _____
10. $\$500$/year $\times$ 18 years _____
11. Goal $\$12{,}000$ at $\$600$/month: months needed _____
12. $\$200$/month $\times$ 6 months + $\$300$ gift _____
13. $\$80$/month for 5 years _____
14. Goal $\$10{,}000$ at $\$1{,}250$/year: years needed _____
15. $\$150$/month $\times$ 36 months _____
16. $\$30$/week $\times$ 52 weeks $\times$ 4 yr _____
17. Interest only: $\$2{,}000$ at 6% simple for 4 yr _____
18. $\$1{,}000$ at 4% compounded annually for 2 yr _____
19. Goal $\$8{,}000$ at $\$200$/month: months needed _____
20. $\$45$/month $\times$ 12 months $\times$ 18 yr _____

Word Problems

21. Beginning when she is born, Nia's parents save $\$45$ every month for her college fund until she turns 18. How much will they have saved, not counting interest? _____

22. Marcus wants to save $\$8{,}000$ for his first year of college. He can put away $\$200$ each month. How many months will it take, and how many years is that? _____

23. A relative gives Priya $\$5{,}000$ for college and puts it in an account that earns 5% compounded annually. How much is it worth after 2 years? _____

24. Two students each save for 4 years. Anna saves $\$75$ a month; Ben saves $\$80$ a week. Who saves more, and by how much? _____

Answer Keys

1. $\$300$
2. $\$4{,}800$
3. $\$4{,}500$
4. $\$3{,}900$
5. 12 months
6. 30 months
7. $\$1{,}200$
8. $\$5{,}512.50$
9. $\$4{,}800$
10. $\$9{,}000$
11. 20 months
12. $\$1{,}500$
13. $\$4{,}800$
14. 8 years
15. $\$5{,}400$
16. $\$6{,}240$
17. $\$480$
18. $\$1{,}081.60$
19. 40 months
20. $\$9{,}720$
21. $\$9{,}720$
22. 40 months, or about $3\frac{1}{3}$ years
23. $\$5{,}512.50$
24. Ben; $\$13{,}040$ more

Step-by-Step Explanations

1. Multiply deposit by number of months: $25 \times 12 = 300$.
2. $100 \times 48 = 4800$ saved in all.
3. Add the deposits to the start: $2000 + 500 \times 5 = 2000 + 2500 = 4500$.
4. $75 \times 52 = 3900$ saved in a year.
5. Divide goal by monthly deposit: $3000 \div 250 = 12$.
6. $6000 \div 200 = 30$ months.
7. Interest $= 1000 \times 0.04 \times 5 = 200$, so total $= 1000 + 200 = 1200$.
8. $A = 5000(1.05)^2 = 5000 \times 1.1025 = 5512.50$.
9. That's 120 months total: $40 \times 120 = 4800$.
10. $500 \times 18 = 9000$ saved over 18 years.
11. $12000 \div 600 = 20$ months.
12. $200 \times 6 = 1200$, then add the gift: $1200 + 300 = 1500$.
13. Five years is 60 months: $80 \times 60 = 4800$.
14. $10000 \div 1250 = 8$ years.
15. $150 \times 36 = 5400$.
16. One year is $30 \times 52 = 1560$; over 4 years, $1560 \times 4 = 6240$.
17. $I = 2000 \times 0.06 \times 4 = 480$.
18. $A = 1000(1.04)^2 = 1000 \times 1.0816 = 1081.60$.
19. $8000 \div 200 = 40$ months.
20. That's 216 months: $45 \times 216 = 9720$.
21. Eighteen years is $18 \times 12 = 216$ months. Each month they save $\$45$, so the total is $216 \times 45 = \$9{,}720$.
22. Divide the goal by the monthly deposit: $8000 \div 200 = 40$ months. Since $40 \div 12 \approx 3.3$, that is about $3\frac{1}{3}$ years.
23. Use $A = P(1+r)^t = 5000(1.05)^2$. Since $1.05^2 = 1.1025$, the value is $5000 \times 1.1025 = \$5{,}512.50$.
24. Anna: $75 \times 12 \times 4 = \$3{,}600$. Ben: $80 \times 52 \times 4 = \$16{,}640$. Ben saves $16640 - 3600 = \$13{,}040$ more.

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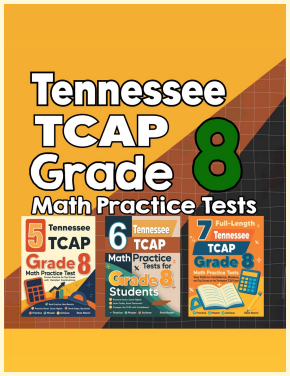

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