

Saving for College

Name: _____ Date: _____ Score: _____ / 24

Q 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: $\text{periods} = \frac{\text{goal}}{\text{amount per period}}$. 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.

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

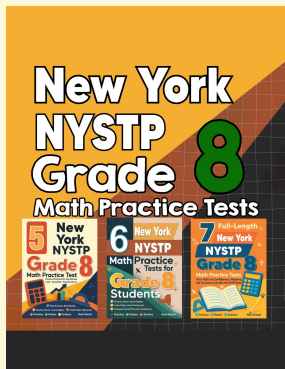
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| <ol style="list-style-type: none"> 1. \$300 2. \$4,800 3. \$4,500 4. \$3,900 5. 12 months 6. 30 months 7. \$1,200 8. \$5,512.50 9. \$4,800 10. \$9,000 11. 20 months 12. \$1,500 | <ol style="list-style-type: none"> 13. \$4,800 14. 8 years 15. \$5,400 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 |
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Step-by-Step Explanations

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| <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 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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