

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

Step-by-Step Explanations

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| <p>1. Multiply deposit by number of months: $25 \times 12 = 300$.</p> <p>2. $100 \times 48 = 4800$ saved in all.</p> <p>3. Add the deposits to the start: $2000 + 500 \times 5 = 2000 + 2500 = 4500$.</p> <p>4. $75 \times 52 = 3900$ saved in a year.</p> <p>5. Divide goal by monthly deposit: $3000 \div 250 = 12$.</p> <p>6. $6000 \div 200 = 30$ months.</p> <p>7. Interest = $1000 \times 0.04 \times 5 = 200$, so total = $1000 + 200 = 1200$.</p> <p>8. $A = 5000(1.05)^2 = 5000 \times 1.1025 = 5512.50$.</p> <p>9. That's 120 months total: $40 \times 120 = 4800$.</p> <p>10. $500 \times 18 = 9000$ saved over 18 years.</p> <p>11. $12000 \div 600 = 20$ months.</p> <p>12. $200 \times 6 = 1200$, then add the gift: $1200 + 300 = 1500$.</p> <p>13. Five years is 60 months: $80 \times 60 = 4800$.</p> <p>14. $10000 \div 1250 = 8$ years.</p> | <p>15. $150 \times 36 = 5400$.</p> <p>16. One year is $30 \times 52 = 1560$; over 4 years, $1560 \times 4 = 6240$.</p> <p>17. $I = 2000 \times 0.06 \times 4 = 480$.</p> <p>18. $A = 1000(1.04)^2 = 1000 \times 1.0816 = 1081.60$.</p> <p>19. $8000 \div 200 = 40$ months.</p> <p>20. That's 216 months: $45 \times 216 = 9720$.</p> <p>21. Eighteen years is $18 \times 12 = 216$ months. Each month they save \$45, so the total is $216 \times 45 = \\$9,720$.</p> <p>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.</p> <p>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$.</p> <p>24. Anna: $75 \times 12 \times 4 = \\$3,600$. Ben: $80 \times 52 \times 4 = \\$16,640$. Ben saves $16640 - 3600 = \\$13,040$ more.</p> |
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