Algebra Word Problems

Lesson 8

Worksheet 8

Algebra Word Problems

Involving

Interest

Algebra Word Problems – Lesson 8 - Worksheet 8 - Algebra Word Problems Involving Interest

Problem 1) You make two investments into two accounts. One pays 9% and one pays 6% interest. If you invest $\$15{,}000$ and the interest after one year is $\$1110$, how much did you put in each investment?

Problem 2) Tom invested $\$8{,}000$ in two investments, part of it at 6.5% and the rest at 4.5%. if the total interest earned after 2 years was $\$880$, how much was put in each investment?

Problem 3) Suppose you invest twice as much money in stocks at 6% interest as you invest in bonds paying 3%. If the total interest earned after 1 year was $\$1050$, how much did you put in each investment?

Problem 4) Suppose you have $\$1{,}500$ less invested at 4% as you have invested at 8%. If the total interest earned after 1 year is $\$720$, how much do you have in each investment?

Problem 5) You have $\$5{,}000$ invested at 6%. How much more money should you invest at 9% to have a yearly interest income of $\$1380$?

Problem 6) You make two investments into two accounts. One pays 4% interest and one pays 6% interest. If you invest $\$10{,}000$ total, with the larger amount placed in the account with 6% interest, and the interest after one year is $\$520$, how much did you put in each investment?

Problem 7) Jim invested $\$6{,}000$ in two investments, part of it at 4.5% and the rest at 3.5%. If the total interest earned after 3 years was $\$750$, how much was put in each investment?

Problem 8) Suppose you invest three times as much in stocks at 7% as you invest in bonds paying 4%. if the total interest earned after 1 year was $\$750$, how much did you put in each investment?

Problem 9) Suppose you have $\$2{,}500$ less invested at 3% as you have invested at 9%. If the total interest earned after 1 year is $\$1125$, how much do you have in each investment?

Problem 10) You have $\$8{,}000$ invested at 6%. How much more money should you invest at 10% to have a yearly interest income of $\$2080$?

Problem 11) You make two investments into two accounts. One pays 7% and one pays 4% interest. If you invest $\$8{,}000$, with the larger amount put in the account with 7% interest, and the interest after one year is $\$500$, how much did you put in each investment?

Problem 12) Tom invested $\$4{,}000$ in two investments, part of it at 8.5% and the rest at 4.5%. if the total interest earned after 2 years was $\$600$, how much was put in each investment?

Problem 13) Suppose you invest four times as much money in stocks at 5% as you invest in bonds paying 4%. if the total interest earned after 1 year was $\$480$, how much did you put in each investment?

Problem 14) Suppose you have $\$3{,}500$ less invested at 2% as you have invested at 6%. If the total interest earned after 2 years is $\$1060$, how much do you have in each investment?

Problem 15) You have $\$6{,}000$ invested at 9%. How much more money should you invest at 12% to have a yearly interest income of $\$1980$?

Problem 16) You make two investments into two accounts. One pays 12% and one pays 8% interest. If you invest $\$5{,}000$, with the larger amount put into the account with 12% interest, and the interest after one year is $\$560$, how much did you put in each investment?

Problem 17) Tom invested $\$9{,}000$ in two investments, part of it at 5.5% and the rest at 4.5%. If the total interest earned after 2 years was $\$910$, how much was put in each investment?

Problem 18) Suppose you invest five times as much in stocks at 8% as you invest in bonds paying 4%. If the total interest earned after 1 year was $\$880$, how much did you put in each investment?

Problem 19) Suppose you have $\$4{,}500$ less invested at 3% as you have invested at 9%. If the total interest earned after 2 years is $\$1650$, how much do you have in each investment?

Problem 20) You have $\$9{,}000$ invested at 15%. How much more money should you invest at 24% to have a yearly interest income of $\$5190$?

Answers - Algebra Word Problems – Lesson 8 - Worksheet 8 - Algebra Word Problems Involving Interest

Problem 1) You make investments into two accounts. One pays 9% interest, while the other pays 6% interest. If you invest $\$15{,}000$, with the smaller amount put into the account with 9% interest, and the interest after one year is $\$1110$, how much did you put in each investment?

Solution:

We calculate interest on accounts using the formula $I = prt$, where I is the interest, p is the amount you invest, r is the interest rate and t is the time in years. Let x represent the investment in the 9% account and $15000 - x$ represent the investment in the 6% account. In this problem $t = 1$. Write the following equation:

$$(9\%)(x) + (6\%)(15000 - x) = 1110$$

$$(0.09)x + (0.06)(15000 - x) = 1110$$

$$0.09x + 900 - 0.06x = 1110$$

$$0.03x + 900 = 1110$$

$$0.03x = 210$$

$$x = 7000$$

If $x = 7000$, then $15000 - 7000 = 8000$

Answer: $\$7000$ at 9%, $\$8000$ at 6%

Problem 2) Tom invested $\$8{,}000$ in two investments, part of it at 6.5% and the rest at 4.5%. If the total interest earned after 2 years was $\$880$, how much was put in each investment?

Solution:

We calculate interest on accounts using the formula $I = prt$, where I is the interest, p is the amount you invest, r is the interest rate and t is the time in years. Let x represent the investment in the 6.5% account and $8000 - x$ represent the investment in the 4.5% account. In this problem $t = 2$. Write the following equation:

$$(6.5\%)(x)(2) + (4.5\%)(8000 - x)(2) = 880$$

$$(0.13)x + (0.09)(8000 - x) = 880$$

$$0.13x + 720 - 0.09x = 880$$

$$0.04x + 720 = 880$$

$$0.04x = 160$$

$$x = 4000$$

If $x = 4000$, then $8000 - 4000 = 4000$

Answer: $\$4000$ at 6.5%, $\$4000$ at 4.5%

Problem 3) Suppose you invest twice as much money in stocks at 6% interest as you invest in bonds paying 3%. If the total interest earned after 1 year was $\$1050$, how much did you put in each investment?

Solution:

We calculate interest on accounts using the formula $I = prt$, where I is the interest, p is the amount you invest, r is the interest rate and t is the time in years. Let x represent the investment in the 3% account and $2x$ represent the investment in the 6% account. In this problem $t = 1$. Write the following equation:

$$(6\%)(2x)(1) + (3\%)(x)(1) = 1050$$

$$(0.12)x + (0.03)x = 1050$$

$$0.15x = 1050$$

$$x = 7000$$

If $x = 7000$, then $2x = 2(7000) = 14000$

Answer: $\$14000$ at 6%, $\$7000$ at 3%

Problem 4) Suppose you have $\$1{,}500$ less invested at 4% as you have invested at 8%. If the total interest earned after 1 year is $\$720$, how much do you have in each investment?

Solution:

We calculate interest on accounts using the formula $I = prt$, where I is the interest, p is the amount you invest, r is the interest rate and t is the time in years. Let x represent the investment in the 8% account and $x - 1500$ represent the investment in the 4% account. In this problem $t = 1$. Write the following equation:

$$(8\%)(x)(1) + (4\%)(x - 1500)(1) = 720$$

$$(0.08)x + (0.04)(x - 1500) = 720$$

$$0.08x + 0.04x - 60 = 720$$

$$0.12x - 60 = 720$$

$$0.12x = 780$$

$$x = 6500$$

If $x = 6500$, then $x - 1500 = 6500 - 1500 = 5000$

Answer: $\$6500$ at 8%, $\$5000$ at 4%

Problem 5) You have $\$5{,}000$ invested at 6%. How much more money should you invest at 9% to have a yearly interest income of $\$1380$?

Solution:

We calculate interest on accounts using the formula $I = prt$, where I is the interest, p is the amount you invest, r is the interest rate and t is the time in years. Let x represent the investment in the 9% account. In this problem $t = 1$. Write the following equation:

$$(6\%)(5000)(1) + (9\%)(x)(1) = 1380$$

$$300 + (0.09)(x) = 1380$$

$$0.09x = 1080$$

$$x = 12000$$

Answer: $\$12000$

Problem 6) You make two investments into two accounts. One pays 4% and one pays 6% interest. If you invest $\$10{,}000$, with the larger amount put into the account with 6% interest, and the interest after one year is $\$520$, how much did you put in each investment?

Solution:

We calculate interest on accounts using the formula $I = prt$, where I is the interest, p is the amount you invest, r is the interest rate and t is the time in years. Let x represent the investment in the 4% account and $10000 - x$ represent the investment in the 6% account. In this problem $t = 1$. Write the following equation:

$$(4\%)(x) + (6\%)(10000 - x) = 520$$

$$(0.04)x + (0.06)(10000 - x) = 520$$

$$0.04x + 600 - 0.06x = 520$$

$$-0.02x + 600 = 520$$

$$-0.02x = -80$$

$$x = 4000$$

If $x = 4000$, then $10000 - 4000 = 6000$

Answer: $\$4000$ at 4%, $\$6000$ at 6%

Problem 7) Jim invested $\$6{,}000$ in two investments, part of it at 4.5% and the rest at 3.5%. If the total interest earned after 3 years was $\$750$, how much was put in each investment?

Solution:

We calculate interest on accounts using the formula $I = prt$, where I is the interest, p is the amount you invest, r is the interest rate and t is the time in years. Let x represent the investment in the 4.5% account and $6000 - x$ represent the investment in the 3.5% account. In this problem $t = 3$. Write the following equation:

$$(4.5\%)(x)(3) + (3.5\%)(6000 - x)(3) = 750$$

$$(0.135)x + (0.105)(6000 - x) = 750$$

$$0.135x + 630 - 0.105x = 750$$

$$0.03x + 630 = 750$$

$$0.03x = 120$$

$$x = 4000$$

If $x = 4000$, then $6000 - 4000 = 2000$

Answer: $\$4000$ at 4.5%, $\$2000$ at 3.5%

Problem 8) Suppose you invest three times as much in stocks at 7% as you invest in bonds paying 4%. If the total interest earned after 1 year was $\$750$, how much did you put in each investment?

Solution:

We calculate interest on accounts using the formula $I = prt$, where I is the interest, p is the amount you invest, r is the interest rate and t is the time in years. Let x represent the investment in the 4% account and $3x$ represent the investment in the 7% account. In this problem $t = 1$. Write the following equation:

$$(7\%)(3x)(1) + (4\%)(x)(1) = 750$$

$$(0.21)x + (0.04)(x) = 750$$

$$0.25x = 750$$

$$x = 3000$$

If $x = 3000$, then $3x = 3(3000) = 9000$

Answer: $\$9000$ at 7%, $\$3000$ at 4%

Problem 9) Suppose you have $\$2{,}500$ less invested at 3% as you have invested at 9%. The total interest earned after 1 year is $\$1125$, how much do you have in each investment?

Solution:

We calculate interest on accounts using the formula $I = prt$, where I is the interest, p is the amount you invest, r is the interest rate and t is the time in years. Let x represent the investment in the 9% account and $x - 2500$ represent the investment in the 3% account. In this problem $t = 1$. Write the following equation:

$$(9\%)(x)(1) + (3\%)(x - 2500)(1) = 1125$$

$$(0.09)x + (0.03)(x - 2500) = 1125$$

$$0.09x + 0.03x - 75 = 1125$$

$$0.12x - 75 = 1125$$

$$0.12x = 1200$$

$$x = 10000$$

If $x = 10000$, then $x - 2500 = 10000 - 2500 = 7500$

Answer: $\$10000$ at 9%, $\$7500$ at 3%

Problem 10) You have $\$8{,}000$ invested at 6%. How much more money should you invest at 10% to have a yearly interest income of $\$2080$?

Solution:

We calculate interest on accounts using the formula $I = prt$, where I is the interest, p is the amount you invest, r is the interest rate and t is the time in years. Let x represent the investment in the 10% account. In this problem $t = 1$. Write the following equation:

$$(6\%)(8000)(1) + (10\%)(x)(1) = 2080$$

$$(0.06)(8000)(1) + (0.10)(x)(1) = 2080$$

$$480 + (0.10)(x) = 2080$$

$$0.10x = 1600$$

$$x = 16000$$

Answer: $\$16000$

Problem 11) You make two investments into two accounts. One pays 7% and one pays 4% interest. If you invest $\$8{,}000$, with the larger amount put into the account with 7% interest, and the interest after one year is $\$500$, how much did you put in each investment?

Solution:

We calculate interest on accounts using the formula $I = prt$, where I is the interest, p is the amount you invest, r is the interest rate and t is the time in years. Let x represent the investment in the 7% account and $8000 - x$ represent the investment in the 4% account. In this problem $t = 1$. Write the following equation:

$$(7\%)(x) + (4\%)(8000 - x) = 500$$

$$(0.07)x + (0.04)(8000 - x) = 500$$

$$0.07x + 320 - 0.04x = 500$$

$$0.03x + 320 = 500$$

$$0.03x = 180$$

$$x = 6000$$

If $x = 6000$, then $8000 - 6000 = 2000$

Answer: $\$6000$ at 7%, $\$2000$ at 4%

Problem 12) Tom invested $\$4{,}000$ in two investments, part at 8.5% and the rest at 4.5%. If the total interest earned after 2 years was $\$600$, how much was put in each investment?

Solution:

We calculate interest on accounts using the formula $I = prt$, where I is the interest, p is the amount you invest, r is the interest rate and t is the time in years. Let x represent the investment in the 8.5% account and $4000 - x$ represent the investment in the 4.5% account. In this problem $t = 2$. Write the following equation:

$$(8.5\%)(x)(2) + (4.5\%)(4000 - x)(2) = 600$$

$$(0.17)x + (0.09)(4000 - x) = 600$$

$$0.17x + 360 - 0.09x = 600$$

$$0.08x + 360 = 600$$

$$0.08x = 240$$

$$x = 3000$$

If $x = 3000$, then $4000 - 3000 = 1000$

Answer: $\$3000$ at 8.5%, $\$1000$ at 4.5%

Problem 13) Suppose you invest four times as much in stocks at 5% as you invest in bonds paying 4%. If the total interest earned after 1 year was $\$480$, how much did you put in each investment?

Solution:

We calculate interest on accounts using the formula $I = prt$, where I is the interest, p is the amount you invest, r is the interest rate and t is the time in years. Let x represent the investment in the 4% account and $4x$ represent the investment in the 5% account. In this problem $t = 1$. Write the following equation:

$$(5\%)(4x)(1) + (4\%)(x)(1) = 480$$

$$(0.20)x + (0.04)(x) = 480$$

$$0.24x = 480$$

$$x = 2000$$

If $x = 2000$, then $4x = 4(2000) = 8000$

Answer: $\$8000$ at 5%, $\$2000$ at 4%

Problem 14) Suppose you have $\$3{,}500$ less invested at 2% as you have invested at 6%. If the total interest earned after 2 years is $\$1060$, how much do you have in each investment?

Solution:

We calculate interest on accounts using the formula $I = prt$, where I is the interest, p is the amount you invest, r is the interest rate and t is the time in years. Let x represent the investment in the 6% account and $x - 3500$ represent the investment in the 2% account. In this problem $t = 2$. Write the following equation:

$$(6\%)(x)(2) + (2\%)(x - 3500)(2) = 1060$$

$$(0.12)x + (0.04)(x - 3500) = 1060$$

$$0.12x + 0.04x - 140 = 1060$$

$$0.16x - 140 = 1060$$

$$0.16x = 1200$$

$$x = 7500$$

If $x = 7500$, then $x - 3500 = 7500 - 3500 = 4000$

Answer: $\$7500$ at 6%, $\$4000$ at 2%

Problem 15) You have $\$6{,}000$ invested at 9%. How much more money should you invest at 12% to have a yearly interest income of $\$1980$?

Solution:

We calculate interest on accounts using the formula $I = prt$, where I is the interest, p is the amount you invest, r is the interest rate and t is the time in years. Let x represent the investment in the 12% account. In this problem $t = 1$. Write the following equation:

$$(9\%)(6000)(1) + (12\%)(x)(1) = 1980$$

$$540 + (0.12)(x) = 1980$$

$$0.12x = 1440$$

$$x = 12000$$

Answer: $\$12000$

Problem 16) You make two investments into two accounts. One pays 12% and one pays 8% interest. If you invest $\$5{,}000$, with the larger amount put into the account with 12% interest, and the interest after one year is $\$560$, how much did you put in each investment?

Solution:

We calculate interest on accounts using the formula $I = prt$, where I is the interest, p is the amount you invest, r is the interest rate and t is the time in years. Let x represent the investment in the 12% account and $5000 - x$ represent the investment in the 8% account. In this problem $t = 1$. Write the following equation:

$$(12\%)(x) + (8\%)(5000 - x) = 560$$

$$(0.12)x + (0.08)(5000 - x) = 560$$

$$0.12x + 400 - 0.08x = 560$$

$$0.04x + 400 = 560$$

$$0.04x = 160$$

$$x = 4000$$

If $x = 4000$, then $5000 - 4000 = 1000$

Answer: $\$4000$ at 12%, $\$1000$ at 8%

Problem 17) Tom invested $\$9{,}000$ in two investments, part of it at 5.5% and the rest at 4.5%. If the total interest earned after 2 years was $\$910$, how much was put in each investment?

Solution:

We calculate interest on accounts using the formula $I = prt$, where I is the interest, p is the amount you invest, r is the interest rate and t is the time in years. Let x represent the investment in the 5.5% account and $9000 - x$ represent the investment in the 4.5% account. In this problem $t = 2$. Write the following equation:

$$(5.5\%)(x)(2) + (4.5\%)(9000 - x)(2) = 910$$

$$(0.11)x + (0.09)(9000 - x) = 910$$

$$0.11x + 810 - 0.09x = 910$$

$$0.02x + 810 = 910$$

$$0.02x = 100$$

$$x = 5000$$

If $x = 5000$, then $9000 - 5000 = 4000$

Answer: $\$5000$ at 5.5%, $\$4000$ at 4.5%

Problem 18) Suppose you invest five times as much in stocks at 8% as you invest in bonds paying 4%. If the total interest earned after 1 year was $\$880$, how much did you put in each investment?

Solution:

We calculate interest on accounts using the formula $I = prt$, where I is the interest, p is the amount you invest, r is the interest rate and t is the time in years. Let x represent the investment in the 4% account and $5x$ represent the investment in the 8% account. In this problem $t = 1$. Write the following equation:

$$(8\%)(5x)(1) + (4\%)(x)(1) = 880$$

$$(0.40)x + (0.04)(x) = 880$$

$$0.44x = 880$$

$$x = 2000$$

If $x = 2000$, then $5x = 5(2000) = 10000$

Answer: $\$10000$ at 8%, $\$2000$ at 4%

Problem 19) Suppose you have $\$4{,}500$ less invested at 3% as you have invested at 9%. The total interest earned after 2 years is $\$1650$, how much do you have in each investment?

Solution:

We calculate interest on accounts using the formula $I = prt$, where I is the interest, p is the amount you invest, r is the interest rate and t is the time in years. Let x represent the investment in the 9% account and $x - 4500$ represent the investment in the 3% account. In this problem $t = 2$. Write the following equation:

$$(9\%)(x)(2) + (3\%)(x - 4500)(2) = 1650$$

$$(0.18)x + (0.06)(x - 4500) = 1650$$

$$0.18x + 0.06x - 270 = 1650$$

$$0.24x = 1920$$

$$x = 8000$$

If $x = 8000$, then $x - 4500 = 8000 - 4500 = 3500$

Answer: $\$8000$ at 9%, $\$3500$ at 3%

Problem 20) You have $\$9{,}000$ invested at 15%. How much more money should you invest at 24% to have a yearly interest income of $\$5190$?

Solution:

We calculate interest on accounts using the formula $I = prt$, where I is the interest, p is the amount you invest, r is the interest rate and t is the time in years. Let x represent the investment in the 24% account. In this problem $t = 1$. Write the following equation:

$$(15\%)(9000)(1) + (24\%)(x)(1) = 5190$$

$$1350 + (0.24)(x) = 5190$$

$$0.24x = 3840$$

$$x = 16000$$

Answer: $\$16000$