

Systems of Equations – Day 3
Integers, Fundraisers, Home Improvements, Ticket Sales, & Transportation
Unit 5: Real World Applications

Solve each question. Round your answer to the nearest hundredth when needed.

1. The sum of two numbers is 25. Their difference is 1. What are the numbers?	<i>12 and 13</i>
2. The sum of two numbers is 21. Their difference is 7. Find the numbers.	<i>7 and 14</i>
3. The difference of two numbers is 0.9. Their sum is 18.9. What are the numbers?	<i>9 and 9.9</i>
4. The difference of two numbers is 1.1. Their sum is 16.3. Find the numbers.	<i>7.6 and 8.7</i>
5. Jill and Nicole are selling pies for a school fundraiser. Customers can buy cherry pies and pumpkin pies. Jill sold 4 cherry pies and 2 pumpkin pies for a total of \$72. Nicole sold 13 cherry pies and 3 pumpkin pies for a total of \$164. What is the cost for each of one cherry pie and one pumpkin pie?	<i>\$8 per cherry pie \$20 per pumpkin pie</i>
6. Wilbur and Kim are selling fruit for a school fundraiser. Customers can buy small boxes of tangerines and large boxes of tangerines. Wilbur sold 4 small boxes and 9 large boxes for a total of \$213. Kim sold 12 small boxes and 5 large boxes for a total of \$265. What is the cost for each one small box and one large box of tangerines?	<i>\$15 per small box of tangerines \$17 per large box of tangerines</i>
7. Adam and Dan are selling flower bulbs for a school fundraiser. Customers can buy bags of windflower bulbs and packages of crocus bulbs. Adam sold 13 bags of windflower bulbs and 8 packages of crocus bulbs for a total of \$219.80. Dan sold 9 bags of windflower bulbs and 8 packages of crocus bulbs for a total of \$179. What is the cost for each one bag of windflower bulbs and one package of crocus bulbs?	<i>\$10.20 windflower bulbs \$10.90 crocus bulbs</i>
8. Jose and James are selling cheesecakes for a school fundraiser. Customers can buy New York style cheesecakes and strawberry cheesecakes. Jose sold 2 New York style cheesecakes and 9 strawberry cheesecakes for a total of \$127.50. James sold 5 New York style cheesecakes and 6 strawberry cheesecakes for a total of \$115.80. What is the cost for each one New York style cheesecake and one strawberry cheesecake?	<i>\$8.40 per New York cheesecakes \$12.30 per strawberry cheesecake</i>
9. Lea and Henry each improved their yards by planting hostas and geraniums. They bought their supplies from the same store. Lea spent \$110 on 3 hostas and 14 geraniums. Henry spent \$80 on 6 hostas and 8 geraniums. Find the cost of one hosta and the cost of one geranium.	<i>\$4 per hosta \$7 per geranium</i>

10. Bill and Carol each improved their yards by planting rose bushes and ivy. They bought their supplies from the same store. Bill spent \$48 on 1 rose bush and 10 pots of ivy. Carol spent \$128 on 11 rose bushes and 10 pots of ivy. What is the cost of one rose bush and the cost of one pot of ivy?

\$8 per rose bush

\$4 per pot of ivy

11. John and Madison each improved their yards by planting daylilies and geraniums. They bought their supplies from the same store. John spent \$126.10 on 7 daylilies and 6 geraniums. Madison spent \$128.60 on 2 daylilies and 12 geraniums. What is the cost of one daylily and the cost of one geranium?

\$10.30 per daylily

\$9 per geranium

12. Joe and Jose each improved their yards by planting grass sod and shrubs. They bought their supplies from the same store. Joe spent \$73.50 on 5 m^2 of grass sod and 4 shrubs. Jose spent \$226.80 on 14 m^2 of grass sod and 14 shrubs. Find the cost of one m^2 of grass sod and the cost of one shrub.

\$8.70 per m^2 of grass sod

\$7.50 per shrub

13. The school that Samantha goes to is selling tickets to a spring musical. On the first day of ticket sales the school sold 6 adult tickets and 10 student tickets for a total of \$154. The school took in \$259 on the second day by selling 14 adult tickets and 9 student tickets. Find the price of an adult ticket and the price of a student ticket.

\$14 per adult ticket

\$7 per student ticket

14. LeAnne's school is selling tickets to a spring musical. On the first day of ticket sales the school sold 14 senior citizen tickets and 1 student ticket for a total of \$160. The school took in \$169 on the second day by selling 11 senior citizen tickets and 8 student tickets. What is the price for each one senior citizen ticket and one student ticket?

\$11 per senior citizen ticket

\$6 per student ticket

15. Jack's school is selling tickets to a play. On the first day of ticket sales the school sold 4 senior citizen tickets and 4 child tickets for a total of \$52.04. The school took in \$64.16 on the second day by selling 6 senior citizen tickets and 4 child tickets. Find the price of a senior citizen ticket and the price of a child ticket.

\$6.06 per senior citizen ticket

\$6.95 per child ticket

16. The school that Coen goes to is selling tickets to a spring musical. On the first day of ticket sales the school sold 9 adult tickets and 3 student tickets for a total of \$74.70. The school took in \$98.10 on the second day by selling 7 adult tickets and 9 student tickets. What is the price for each one adult ticket and one student ticket?

\$6.30 per adult ticket

\$6 per student ticket

17. New York City is a popular field trip destination. This year the senior class of Bourbonnais and the senior class of Kankakee both planned trips there. The senior class at Bourbonnais rented and filled 13 vans and 3 buses with 348 students. Kankakee rented and filled 12 vans and 14 buses with 748 students. Each van and each bus carried the same number of students. Find the number of students in each van and on each bus.

18 students per van

38 students per bus

18. The indoor climbing gym is a popular field trip destination. This year Maple and John Greer both planned trips there. Maple rented and filled 2 vans and 12 buses with 562 students. John Greer rented and filled 1 van and 12 buses with 545 students. Every van had the same number of students in it as did the buses. How many students can a van carry? How many students can a bus carry?

17 students per van

44 students per bus

① Sum Equation
Difference Equation

$$\begin{array}{r} x + y = 25 \\ x - y = 1 \\ \hline \end{array}$$

$$\frac{2x}{2} = \frac{26}{2}$$

$$x = 13$$

using

$$\begin{array}{r} x + y = 25 \\ 13 + y = 25 \\ \hline -13 \quad -13 \end{array}$$

$$y = 12$$

② Sum Equation
Difference Equation

$$\begin{array}{r} x + y = 21 \\ x - y = 7 \\ \hline \end{array}$$

$$\frac{2x}{2} = \frac{28}{2}$$

$$x = 14$$

using

$$\begin{array}{r} x + y = 21 \\ 14 + y = 21 \\ \hline -14 \quad -14 \end{array}$$

$$y = 7$$

③ Sum Equation
Difference Equations

$$\begin{array}{r} x + y = 18.9 \\ x - y = 0.9 \\ \hline \end{array}$$

$$\frac{2x}{2} = \frac{19.8}{2}$$

$$x = 9.9$$

using

$$\begin{array}{r} x + y = 18.9 \\ 9.9 + y = 18.9 \\ \hline -9.9 \quad -9.9 \end{array}$$

$$y = 9$$

④ Sum Equation
Difference Equation

$$\begin{array}{r} x + y = 16.3 \\ x - y = 1.1 \\ \hline \end{array}$$

$$\frac{2x}{2} = \frac{17.4}{2}$$

$$x = 8.7$$

Using

$$\begin{array}{r} x + y = 16.3 \\ 8.7 + y = 16.3 \\ \hline -8.7 \quad -8.7 \end{array}$$

$$y = 7.6$$

⑤ Jill's Equation $3[4c + 2p = 72] \cdot 3$
 Nicole's Equation $-2[3c + 3p = 164] \cdot -2$

Using

$$\begin{array}{r} 4c + 2p = 72 \\ 4(8) + 2p = 72 \\ 32 + 2p = 72 \\ \underline{-32} \quad \underline{-32} \end{array}$$

$$\frac{2p}{2} = \frac{40}{2}$$

$p = \$20$

$$\begin{array}{r} 12c + 6p = 216 \\ -26c - 6p = -328 \\ \hline -14c = -112 \\ \underline{-14} \quad \underline{-14} \end{array}$$

$c = \$8$

$\$8$ per cherry pie
 $\$20$ per pumpkin pie

⑥ Wilbur's Equation
 Kim's Equation

Using

$$\begin{array}{r} 4s + 9l = 213 \\ 4s + 9(17) = 213 \\ 4s + 153 = 213 \\ \underline{-153} \quad \underline{-153} \end{array}$$

$$\frac{4s}{4} = \frac{60}{4}$$

$s = \$15$

$$\begin{array}{r} -3(4s + 9l = 213) \cdot -3 \\ 12s + 5l = 265 \\ -12s - 27l = -639 \\ \hline -22l = -374 \\ \underline{-22} \quad \underline{-22} \end{array}$$

$l = \$17$

$\$15$ per small box of tangerines
 $\$17$ per large box of tangerines

⑦ Adam's Equation
 Dan's Equation

Using

$$\begin{array}{r} 9w + 8c = 179 \\ 9(10.20) + 8c = 179 \\ 91.80 + 8c = 179 \\ \underline{-91.80} \quad \underline{-91.80} \end{array}$$

$$\frac{8c}{8} = \frac{87.20}{8}$$

$c = \$10.90$

$$\begin{array}{r} 13w + 8c = 219.80 \\ -1(9w + 8c = 179) \cdot -1 \\ \hline 4w = 40.80 \\ \underline{4} \quad \underline{4} \end{array}$$

$w = \$10.20$

$\$10.20$ per windflower bulbs
 $\$10.90$ per crocus bulbs

⑧ José's Equation
James' Equation

Using

$$\begin{array}{r} 2N + 9s = 127.50 \\ 2N + 9(12.30) = 127.50 \\ 2N + 110.70 = 127.50 \\ -110.70 \quad -110.70 \\ \hline 2N = 16.80 \\ \frac{2N}{2} = \frac{16.80}{2} \\ N = \$8.40 \end{array}$$

$$\begin{array}{r} 5[2N + 9s = 127.50] \cdot 5 \\ -2[5N + 6s = 115.80] \cdot -2 \end{array}$$

$$\begin{array}{r} 10N + 45s = 637.50 \\ -10N - 12s = -231.60 \\ \hline \end{array}$$

$$\frac{33s}{33} = \frac{405.90}{33}$$

$$s = \$12.30$$

\$8.40 per New York style
\$12.30 per Strawberry

⑨ Lea's Equation
Henry's Equation

using

$$\begin{array}{r} 3h + 14g = 110 \\ 3h + 14(7) = 110 \\ 3h + 98 = 110 \\ -98 \quad -98 \\ \hline 3h = 12 \\ \frac{3h}{3} = \frac{12}{3} \\ h = \$4 \end{array}$$

$$-2[3h + 14g = 110] \cdot -2$$

$$\begin{array}{r} 6h + 8g = 80 \\ -6h - 28g = -220 \\ \hline \end{array}$$

$$\frac{-20g}{-20} = \frac{-140}{-20}$$

$$g = \$7$$

\$4 per hosta
\$7 per geranium

⑩ Bill's Equation
Carol's Equation

Using

$$\begin{array}{r} 1r + 10p = 48 \\ 8 + 10p = 48 \\ -8 \quad -8 \\ \hline 10p = 40 \\ \frac{10p}{10} = \frac{40}{10} \\ p = \$4 \end{array}$$

$$-1[1r + 10p = 48] \cdot -1$$

$$\begin{array}{r} 1r + 10p = 48 \\ -1r - 10p = -48 \\ \hline \end{array}$$

$$\frac{10r}{10} = \frac{80}{10}$$

$$r = \$8$$

\$8 per rose bush
\$4 per pot of ivy

⑪ John's Equation
Madison's Equation

$$\begin{array}{r} -2[7d + 6g = 126.10] \cdot -2 \\ 2d + 12g = 128.60 \\ -14d - 12g = -252.20 \end{array}$$

Using

$$\begin{array}{r} 2d + 12g = 128.60 \\ 2(10.30) + 12g = 128.60 \\ 20.60 + 12g = 128.60 \\ \underline{-20.60} \quad \underline{-20.60} \end{array}$$

$$\begin{array}{r} 12g = 108 \\ \underline{12} \quad \underline{12} \\ g = 9 \end{array}$$

$$\begin{array}{r} -12d = -123.60 \\ \underline{-12} \quad \underline{-12} \end{array}$$

$$d = \$10.30$$

\$10.30 per daisy
\$9.00 per geranium

⑫ Joe's Equation
Jose's Equation

$$\begin{array}{r} 14[5g + 4s = 73.50] \cdot 14 \\ -5[14g + 14s = 226.80] \cdot -5 \end{array}$$

Using

$$\begin{array}{r} 5g + 4s = 73.50 \\ 5g + 4(7.50) = 73.50 \\ 5g + 30 = 73.50 \\ \underline{-30} \quad \underline{-30.00} \end{array}$$

$$\begin{array}{r} 5g = 43.50 \\ \underline{5} \quad \underline{5} \\ g = 8.70 \end{array}$$

$$\begin{array}{r} 70g + 56s = 1029 \\ -70g - 70s = -1134 \end{array}$$

$$\begin{array}{r} -14s = -105 \\ \underline{-14} \quad \underline{-14} \end{array}$$

$$s = \$7.50$$

\$7.50 per shrub
\$8.70 per m³ of grass sod

⑬ Day 1 Sales
Day 2 Sales

$$\begin{array}{r} 9[6a + 10s = 154] \cdot 9 \\ -10[14a + 9s = 259] \cdot -10 \end{array}$$

Using

$$\begin{array}{r} 6a + 10s = 154 \\ 6(14) + 10s = 154 \\ 84 + 10s = 154 \\ \underline{-84} \quad \underline{-84} \end{array}$$

$$\begin{array}{r} 10s = 70 \\ \underline{10} \quad \underline{10} \\ s = 7 \end{array}$$

$$\begin{array}{r} 54a + 90s = 1386 \\ -140a - 90s = -2590 \end{array}$$

$$\begin{array}{r} -86a = -1204 \\ \underline{-86} \quad \underline{-86} \end{array}$$

$$a = \$14$$

\$14 per adult ticket
\$7 per student ticket

⑭ Day 1 Sales
Day 2 Sales

Using

$$\begin{array}{r} 14s + 1c = 160 \\ 14(11) + 1c = 160 \\ 154 + 1c = 160 \\ \hline -154 \qquad -154 \\ \hline \end{array}$$

$$c = \$6$$

$$\begin{array}{r} 8[14s + 1c = 160] \cdot 8 \\ -1[11s + 8c = 169] \cdot -1 \end{array}$$

$$\begin{array}{r} 112s + 8c = 1280 \\ -11s - 8c = -169 \\ \hline \end{array}$$

$$\frac{101s}{101} = \frac{1111}{101}$$

$$s = \$11$$

\$11 per senior citizen ticket
\$6 per student ticket

⑮ Day 1 Sales
Day 2 Sales

using

$$\begin{array}{r} 4s + 4c = 52.04 \\ 4(6.06) + 4c = 52.04 \\ 24.24 + 4c = 52.04 \\ \hline -24.24 \qquad -24.24 \\ \hline \end{array}$$

$$\frac{4c}{4} = \frac{27.80}{4}$$

$$c = \$6.95$$

$$\begin{array}{r} 4s + 4c = 52.04 \\ -1[6s + 4c = 64.16] \cdot -1 \end{array}$$

$$\frac{-2s}{-2} = \frac{-12.12}{-2}$$

$$s = \$6.06$$

\$6.06 per senior citizen ticket
\$6.95 per student ticket

⑯ Day 1 Sales
Day 2 Sales

Using

$$\begin{array}{r} 9a + 3s = 74.70 \\ 9(6.30) + 3s = 74.70 \\ 56.70 + 3s = 74.70 \\ \hline -56.70 \qquad -56.70 \\ \hline \end{array}$$

$$\frac{3s}{3} = \frac{18.00}{3}$$

$$s = \$6.00$$

$$\begin{array}{r} -3[9a + 3s = 74.70] \cdot -3 \\ 7a + 9s = 98.10 \\ -27a - 9s = -224.10 \\ \hline \end{array}$$

$$\frac{-20a}{-20} = \frac{-126}{-20}$$

$$a = \$6.30$$

\$6.30 per adult ticket
\$6.00 per student ticket

17) Bourbonnais
Kankakee

Using

$$13v + 3b = 348$$

$$13(18) + 3b = 348$$

$$\begin{array}{r} 234 + 3b = 348 \\ -234 \quad \quad -234 \\ \hline \end{array}$$

$$\frac{3b}{3} = \frac{114}{3}$$

$$b = 38$$

$$14[13v + 3b = 348] \cdot 14$$

$$-3[12v + 14b = 748] \cdot -3$$

$$182v + 42b = 4872$$

$$-36v - 42b = -2244$$

$$\frac{146v}{146} = \frac{2628}{146}$$

$$v = 18$$

18 students per van
38 students per bus

18) Maple
John Greer

Using

$$v + 12b = 545$$

$$\begin{array}{r} 17 + 12b = 545 \\ -17 \quad \quad -17 \\ \hline \end{array}$$

$$\frac{12b}{12} = \frac{528}{12}$$

$$b = 44$$

$$\begin{array}{r} 2v + 12b = 562 \\ -1[1v + 12b = 545] \cdot -1 \\ \hline \end{array}$$

$$v = 17$$

17 students per van
44 students per bus