

Systems of Equations – Day 4
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 difference of two numbers is 1. Their sum is 21. What are the numbers? <i>10 and 11</i>
2. Find the value of two numbers if their sum is 21 and their difference is 7. <i>7 and 14</i>
3. Find the value of two numbers if their sum is 24.6 and their difference is 2.4. <i>11.1 and 13.5</i>
4. The sum of two numbers is 14.9. Their difference is 0.9. Find the numbers. <i>7 and 7.9</i>
5. Stephanie and Robbie are selling cheesecakes for a school fundraiser. Customers can buy pecan cheesecakes and apple cheesecakes. Stephanie sold 14 pecan cheesecakes and 9 apple cheesecakes for a total of \$214. Robbie sold 9 pecan cheesecakes and 6 apple cheesecakes for a total of \$141. What is the cost for each one pecan cheesecake and one apple cheesecake? <i>\$5 per pecan cheesecake</i> <i>\$16 per apple cheesecake</i>
6. Leo and Julio are selling cookie dough for a school fundraiser. Customers can buy packages of sugar cookie dough and packages of oatmeal cookie dough. Leo sold 4 packages of sugar cookie dough and 11 packages of oatmeal cookie dough for a total of \$208. Julio sold 5 packages of sugar cookie dough and 14 packages of oatmeal cookie dough for a total of \$264. Find the cost for each one package of sugar cookie dough and one package of oatmeal cookie dough. <i>\$8.00 per sugar cookie dough</i> <i>\$16.00 per oatmeal cookie dough</i>
7. Shawna and Alanda are selling wrapping paper for a school fundraiser. Customers can buy rolls of plain wrapping paper and rolls of shiny wrapping paper. Shawna sold 14 rolls of plain wrapping paper and 9 rolls of shiny wrapping paper for a total of \$373.40. Alanda sold 13 rolls of plain wrapping paper and 4 rolls of shiny wrapping paper for a total of \$262.20. What is the cost for each one roll of plain wrapping paper and one roll of shiny wrapping paper? <i>\$14.20 plain wrapping paper</i> <i>\$19.40 shiny wrapping paper</i>
8. Abraham and George are selling flower bulbs for a school fundraiser. Customers can buy bags of windflower bulbs and bags of daffodil bulbs. Abraham sold 10 bags of windflower bulbs and 5 bags of daffodil bulbs for a total of \$241.65. George sold 8 bags of windflower bulbs and 10 bags of daffodil bulbs for a total of \$308.34. What is the cost for each one bag of windflower bulbs and one bag of daffodil bulbs? <i>\$14.58 windflower bulbs</i> <i>\$19.17 daffodil bulbs</i>
9. Shrek and Fiona each improved their yards by planting hostas and shrubs. They bought their supplies from the same store. Shrek spent \$112 on 12 hostas and 10 shrubs. Fiona spent \$118 on 13 hostas and 10 shrubs. Find the cost of one hosta and the cost of one shrub. <i>\$6 per hosta</i> <i>\$4 per shrub</i>

10. Jose and Kevin each improved their yards by planting rose bushes and shrubs. They bought their supplies from the same store. Jose spent \$192 on 3 rose bushes and 14 shrubs. Kevin spent \$176 on 1 rose bush and 14 shrubs. What is the cost of one rose bush and the cost of one shrub?

\$8 per rose bush

\$12 per shrub

11. Darryl and Dan each improved their yards by planting grass sod and geraniums. They bought their supplies from the same store. Darryl spent \$151 on 7 ft^2 of grass sod and 11 geraniums. Dan spent \$129.40 on 7 ft^2 of grass sod and 9 geraniums. What is the cost for one ft^2 of grass sod and the cost of one geranium?

\$4.60 per ft^2 of grass sod

\$10.80 per geranium

12. Danielle and Kristen each improved their yards by planting hostas and ivy. They bought their supplies from the same store. Danielle spent \$108.80 on 14 hostas and 4 pots of ivy. Kristen spent \$205.80 on 14 hostas and 14 pots of ivy. Find the cost of one hosta and the cost of one pot of ivy.

\$5 per hosta

\$9.70 per pot of ivy

13. Jennifer's school is selling tickets to the spring musical. On the first day of ticket sale the school sold 5 adult tickets and 13 student tickets for a total of \$125. The school took in \$197 on the second day by selling 11 adult tickets and 13 student tickets. Find the price of an adult ticket and the price of a student ticket.

\$12 per adult ticket

\$5 per student ticket

14. Khloe's school is selling tickets to a spring musical. On the first day of ticket sales the school sold 12 senior citizen tickets and 11 student tickets for a total of \$256. The school took in \$186 on the second day by selling 7 senior citizen tickets and 11 student tickets. Find the price of a senior citizen ticket and the price of a student ticket.

\$14 per senior citizen ticket

\$8 per student ticket

15. The school that Bryson goes to is selling tickets to a spring musical. On the first day of ticket sales the school sold 4 senior citizen tickets and 1 student ticket for a total of \$38.40. The school took in \$48 on the second day by selling 4 senior citizen tickets and 3 student tickets. Find the price of a senior citizen ticket and the price of a student ticket.

\$8.40 per senior citizen ticket

\$4.80 per student ticket

16. The school that Babby goes to is selling tickets to a fall musical. On the first day of ticket sales the school sold 9 senior citizen tickets and 12 student tickets for a total of \$232.50. The school took in \$101.50 on the second day by selling 12 senior citizen tickets and 1 student ticket. What is the price for each one senior citizen ticket and one student ticket?

\$7.30 per senior citizen ticket

\$13.90 per student ticket

17. The senior classes at Paris and Pana planned separate trips to New York City. The senior class at Paris rented and filled 12 vans and 9 buses with 339 students. Pana rented and filled 6 vans and 10 buses with 296 students. Each van and each bus carried the same number of students. How many students can a van carry? How many students can a bus carry?

11 students per van

23 students per bus

18. The senior classes at Springfield and Vandalia planned separate trips to the indoor climbing gym. The senior class at Springfield rented and filled 6 vans and 5 buses with 277 students. Vandalia rented and filled 12 vans and 13 buses with 677 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?

12 students per van

41 students per bus

① Sum Equation
Difference Equation

$$\begin{array}{r} x + y = 21 \\ x - y = 1 \\ \hline 2x = 22 \\ \hline x = 11 \end{array}$$

using

$$\begin{array}{r} x + y = 21 \\ 11 + y = 21 \\ -11 \quad -11 \\ \hline y = 10 \end{array}$$

② Sum Equation
Difference Equation

$$\begin{array}{r} x + y = 21 \\ x - y = 7 \\ \hline 2x = 28 \\ \hline x = 14 \end{array}$$

using

$$\begin{array}{r} x + y = 21 \\ 14 + y = 21 \\ -14 \quad -14 \\ \hline y = 7 \end{array}$$

③ Sum Equation
Difference Equation

$$\begin{array}{r} x + y = 24.6 \\ x - y = 2.4 \\ \hline 2x = 27 \\ \hline x = 13.5 \end{array}$$

using

$$\begin{array}{r} x + y = 24.6 \\ 13.5 + y = 24.6 \\ -13.5 \quad -13.5 \\ \hline y = 11.1 \end{array}$$

④ Sum Equation
Difference Equation

$$\begin{array}{r} x + y = 14.9 \\ x - y = 0.9 \\ \hline 2x = 15.8 \\ \hline x = 7.9 \end{array}$$

using

$$\begin{array}{r} x + y = 14.9 \\ 7.9 + y = 14.9 \\ -7.9 \quad -7.9 \\ \hline y = 7 \end{array}$$

⑤ Stephanie's Equation

Robbie's Equation

using

$$14p + 9a = 214$$

$$14(5) + 9a = 214$$

$$\begin{array}{r} 70 + 9a = 214 \\ -70 \qquad -70 \end{array}$$

$$\frac{9a}{9} = \frac{144}{9}$$

$$a = 16$$

$$6[14p + 9a = 214] \cdot 6$$

$$-9[9p + 6a = 141] \cdot -9$$

$$84p + 54a = 1284$$

$$-81p - 54a = -1269$$

$$\frac{3p}{3} = \frac{15}{3}$$

$$p = 5$$

\$5 per pecan cheesecake

\$16 per apple cheesecake

⑥ Leo's Equation

Julio's Equation

using

$$4s + 11c = 208$$

$$4s + 11(16) = 208$$

$$\begin{array}{r} 4s + 176 = 208 \\ -176 \qquad -176 \end{array}$$

$$\frac{4s}{4} = \frac{32}{4}$$

$$s = \$8$$

$$5[4s + 11c = 208] \cdot 5$$

$$-4[5s + 14c = 264] \cdot -4$$

$$20s + 55c = 1040$$

$$-20s - 56c = -1056$$

$$\frac{-1c}{-1} = \frac{-16}{-1}$$

$$c = \$16$$

\$8 per package sugar cookies

\$16 per package oatmeal cookies

⑦ Shawna's Equation

Alanda's Equation

using

$$13p + 4s = 262.20$$

$$13(14.20) + 4s = 262.20$$

$$\begin{array}{r} 184.60 + 4s = 262.20 \\ -184.60 \qquad -184.60 \end{array}$$

$$\frac{4s}{4} = \frac{77.60}{4}$$

$$s = \$19.40$$

$$4[14p + 9s = 373.40] \cdot 4$$

$$-9[13p + 4s = 262.20] \cdot -9$$

$$56p + 36s = 1493.60$$

$$-117p - 36s = -2359.80$$

$$\frac{-61p}{-61} = \frac{-866.20}{-61}$$

$$p = \$14.20$$

\$14.20 per plain roll of wrapping paper

\$19.40 per shiny roll of wrapping paper

⑧ Abraham's Equation
George's Equation

using

$$\begin{array}{r} 10w + 5d = 241.65 \\ 10(14.58) + 5d = 241.65 \\ 145.80 + 5d = 241.65 \\ \underline{-145.80} \quad \underline{-145.80} \\ 5d = 95.85 \\ \underline{\quad 5} \quad \underline{\quad 5} \\ d = \$19.17 \end{array}$$

$$\begin{array}{r} -2[10w + 5d = 241.65] \cdot -2 \\ 8w + 10d = 308.34 \\ \underline{-20w - 10d = -483.30} \end{array}$$

$$\frac{-12w}{-12} = \frac{-174.96}{-12}$$

$$w = \$14.58$$

\$14.58 per bag of wild flowers
\$19.17 per bag of daffodils

⑨ Shrek's Equation
Fiona's Equation

using

$$\begin{array}{r} 12h + 10s = 112 \\ 12(6) + 10s = 112 \\ 72 + 10s = 112 \\ \underline{-72} \quad \underline{-72} \\ 10s = 40 \\ \underline{\quad 10} \quad \underline{\quad 10} \\ s = \$4 \end{array}$$

$$\begin{array}{r} 12h + 10s = 112 \\ -1[13h + 10s = 118] \cdot -1 \\ \underline{-13h - 10s = -118} \\ -1h = -6 \\ \underline{\quad -1} \quad \underline{\quad -1} \\ h = \$6 \end{array}$$

$$h = \$6$$

\$6 per hosta
\$4 per shrub

⑩ Jose's Equation
Kevin's Equation

using

$$\begin{array}{r} 1r + 14s = 176 \\ 8 + 14s = 176 \\ \underline{-8} \quad \underline{-8} \\ 14s = 168 \\ \underline{\quad 14} \quad \underline{\quad 14} \\ s = \$12 \end{array}$$

$$\begin{array}{r} 3r + 14s = 192 \\ -1[1r + 14s = 176] \cdot -1 \\ \underline{-1r - 14s = 176} \end{array}$$

$$\frac{2r}{2} = \frac{16}{2}$$

$$r = \$8$$

\$8 per rose bush
\$12 per shrub

⑪ Darryl's Equation
Dan's Equation

$$\begin{array}{r} 7s + 11g = 151 \\ -1[7s + 9g = 129.40] \cdot -1 \\ \hline \end{array}$$

using

$$\begin{array}{r} 7s + 11g = 151 \\ 7s + 11(10.80) = 151 \\ 7s + 118.80 = 151 \\ \underline{-118.80 \quad -118.80} \\ 7s = 32.20 \\ \underline{\quad \quad \quad 7} \end{array}$$

$$s = \$4.60$$

$$\frac{2g}{2} = \frac{21.60}{2}$$

$$g = \$10.80$$

\$4.60 per ft² of grass sod
\$10.80 per geranium

⑫ Danielle's Equation
Kristen's Equation

$$\begin{array}{r} -1[14h + 4p = 108.80] \cdot -1 \\ \hline 14h + 14p = 205.80 \end{array}$$

using

$$\begin{array}{r} 14h + 4p = 108.80 \\ 14h + 4(9.70) = 108.80 \\ 14h + 38.80 = 108.80 \\ \underline{-38.80 \quad -38.80} \end{array}$$

$$\frac{14h}{14} = \frac{70}{14}$$

$$h = \$5$$

$$\frac{10p}{10} = \frac{97}{10}$$

$$p = \$9.70$$

\$5 per hosta
\$9.70 per pot of ivy

⑬ Day 1 Sales
Day 2 Sales

$$\begin{array}{r} -1[5a + 13s = 125] \cdot -1 \\ \hline 11a + 13s = 197 \end{array}$$

using

$$\begin{array}{r} 5a + 13s = 125 \\ 5(12) + 13s = 125 \\ 60 + 13s = 125 \\ \underline{-60 \quad -60} \\ 13s = 65 \\ \underline{\quad \quad \quad 13} \end{array}$$

$$s = \$5$$

$$\frac{6a}{6} = \frac{72}{6}$$

$$a = \$12$$

\$12 per adult ticket
\$5 per student ticket

⑭ Day 1 Sales
Day 2 Sales

$$12c + 11s = 256$$

$$-1[7c + 11s = 186] \cdot -1$$

$$\frac{5c}{5} = \frac{70}{5}$$

$$c = \$14$$

Using

$$7c + 11s = 186$$

$$7(14) + 11s = 186$$

$$98 + 11s = 186$$

$$\begin{array}{r} -98 \\ \hline \end{array}$$

$$\frac{11s}{11} = \frac{88}{11}$$

$$s = \$8$$

\$14 per senior citizen ticket
\$8 per student ticket

⑮ Day 1 Sales
Day 2 Sales

$$-1[4c + 1s = 38.40] \cdot -1$$

$$4c + 3s = 48$$

$$\frac{2s}{2} = \frac{9.60}{2}$$

$$s = \$4.80$$

Using

$$4c + 1s = 38.40$$

$$4c + 4.80 = 38.40$$

$$\begin{array}{r} -4.80 \\ \hline \end{array}$$

$$\frac{4c}{4} = \frac{33.60}{4}$$

$$c = \$8.40$$

\$8.40 per senior citizen ticket
\$4.80 per student ticket

⑯ Day 1 Sales
Day 2 Sales

$$9c + 12s = 232.50$$

$$-12[12c + 1s = 101.50] \cdot -12$$

$$\begin{array}{r} -135c \\ \hline -135 \end{array} = \begin{array}{r} -985.5 \\ \hline -135 \end{array}$$

$$c = \$7.30$$

Using

$$12c + 1s = 101.50$$

$$12(7.30) + s = 101.50$$

$$87.60 + s = 101.50$$

$$\begin{array}{r} -87.60 \\ \hline \end{array}$$

$$s = \$13.90$$

\$7.30 per senior citizen ticket
\$13.90 per student ticket

①⑦ Paris Equation
Pana Equation

$$12v + 9b = 339$$
$$-2[6v + 10b = 296] \cdot -2$$

$$\frac{-11b}{-11} = \frac{-253}{-11}$$

$$b = 23$$

Using

$$6v + 10b = 296$$

$$6v + 10(23) = 296$$

$$6v + 230 = 296$$

$$\begin{array}{r} -230 \\ -230 \end{array}$$

$$\frac{6v}{6} = \frac{66}{6}$$

$$v = 11$$

11 students per van
23 students per bus

①⑧ Springfield Equation
Vandalia Equation

$$-2[6v + 5b = 277] \cdot -2$$
$$12v + 13b = 677$$
$$\underline{-12v + (-10b) = -554}$$

$$\frac{3b}{3} = \frac{123}{3}$$

$$b = 41$$

Using

$$6v + 5b = 277$$

$$6v + 5(41) = 277$$

$$6v + 205 = 277$$

$$\begin{array}{r} -205 \\ -205 \end{array}$$

$$\frac{6v}{6} = \frac{72}{6}$$

$$v = 12$$

12 students per van
41 students per bus