

CC.A.CED.3: Modeling Linear Systems: Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or

1 During the 2010 season, football player McGee's earnings, m , were 0.005 million dollars more than those of his teammate Fitzpatrick's earnings, f . The two players earned a total of 3.95 million dollars. Which system of equations could be used to determine the amount each player earned, in millions of dollars?

- 1) $m + f = 3.95$
- 2) $m - 3.95 = f$
- 3) $f - 3.95 = m$
- 4) $m + 0.005 = f$
- 5) $m + f = 3.95$
- 6) $f + 0.005 = m$

$m = f + .005$
 $m + f = 3.95$

3 The sum of two numbers is 47, and their difference is 15. What is the larger number?

- 1) 16
- 2) 31
- 3) 32
- 4) 36

$x + y = 47$
 $x - y = 15$
 $2x = 62$
 $x = 31$ ✓
 $47 - 31 = 16$

4 The total score in a football game was 72 points. The winning team scored 12 points more than the losing team. How many points did the winning team score?

- 1) 30
- 2) 42
- 3) 54
- 4) 60

$W = L + 12$
 $L + W = 72$
 $L + L + 12 = 72$
 $2L = 60$
 $L = 30$
 $W = 30 + 12$
 $W = 42$
L = losing, W = winning

2 The local deli charges a fee for delivery. On Monday, they delivered two dozen bagels to an office at a total cost of \$8. On Tuesday, three dozen bagels were delivered at a total cost of \$11. Which system of equations could be used to find the cost of a dozen bagels, b , if the delivery fee is f ?

- 1) $b + 2f = 8$
- 2) $2b + f = 8$
- 3) $b + 3f = 11$
- 4) $b + 2f = 8$
- 5) $3b + f = 11$
- 6) $2b + f = 8$
- 7) ~~$3b + f = 11$~~

5 Michael is 25 years younger than his father. The sum of their ages is 53. What is Michael's age?

- 1) 14
- 2) 25
- 3) 28
- 4) 39

$m = f - 25$
 $m + f = 53$
 $f - 25 + f = 53$
 $2f = 78$
 $f = 39$
 $m = 39 - 25$
 $m = 14$

6 Jamie is 5 years older than her sister Amy. If the sum of their ages is 19, how old is Jamie?

- 1) 5
- 2) 7
- 3) 12
- 4) 14

$j = a + 5$
 $j + a = 19$
 $a + 5 + a = 19$
 $2a + 5 = 19$
 $2a = 14$
 $a = 7$
 $j = a + 5$
 $j = 7 + 5$
 $j = 12$

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Name: _____

7 Mo's farm stand sold a total of 165 pounds of apples and peaches. She sold apples for \$1.75 per pound and peaches for \$2.50 per pound. If she made \$337.50, how many pounds of peaches did she sell?

1) 11
 2) 18
 3) 65
 4) 100

$$-1.75(a + p = 165)$$

$$1.75a + 2.50p = 337.50$$

$$-1.75a - 1.75p = -298.75$$

$$\underline{1.75a + 2.50p = 337.50}$$

$$0.75p = 48.75$$

8 Last week, a candle store received \$355.60 for selling 20 candles. Small candles sell for \$10.98 and large candles sell for \$27.98. How many large candles did the store sell?

1) 6
 2) 8
 3) 10
 4) 12

$$-10.98(S + L = 20)$$

$$10.98S + 27.98L = 355.60$$

$$-10.98S - 10.98L = -219.60$$

$$\underline{10.98S + 27.98L = 355.60}$$

$$17L = 136$$

9 Jack bought 3 slices of cheese pizza and 4 slices of mushroom pizza for a total cost of \$12.50. Grace bought 3 slices of cheese pizza and 2 slices of mushroom pizza for a total cost of \$8.50. What is the cost of one slice of mushroom pizza?

1) \$1.50
 2) \$2.00
 3) \$3.00
 4) \$3.50

$$3c + 4m = 12.50$$

$$-1(3c + 2m = 8.50)$$

$$\underline{3c + 4m = 12.50}$$

$$-3c - 2m = -8.50$$

$$2m = 4.00$$

10 Pam is playing with red and black marbles. The number of red marbles she has is three more than twice the number of black marbles she has. She has 42 marbles in all. How many red marbles does Pam have?

1) 13
 2) 15
 3) 29
 4) 33

$$r = 2b + 3$$

$$r + b = 42$$

$$2b + 3 + b = 42$$

$$3b = 39$$

$$b = 13$$

$$r = 2b + 3$$

$$r = 2(13) + 3$$

$$r = 29$$

11 Sam and Odel have been selling frozen pizzas for a class fundraiser. Sam has sold half as many pizzas as Odel. Together they have sold a total of 126 pizzas. How many pizzas did Sam sell?

1) 21
 2) 42
 3) 63
 4) 84

$$S = \frac{1}{2}O$$

$$S + O = 126$$

$$\frac{1}{2}O + O = 126$$

$$\frac{1.5O = 126}{1.5} \rightarrow O = 84$$

$$S = \frac{1}{2}O \rightarrow \frac{1}{2}(84) = 42$$

12 Julia went to the movies and bought one jumbo popcorn and two chocolate chip cookies for \$5.00. Marvin went to the same movie and bought one jumbo popcorn and four chocolate chip cookies for \$6.00. How much does one chocolate chip cookie cost?

1) \$0.50
 2) \$0.75
 3) \$1.00
 4) \$2.00

$$-(p + 2c = 5)$$

$$p + 4c = 6$$

$$-p - 2c = -5$$

$$\underline{p + 4c = 6}$$

$$2c = 1$$

$$c = 0.50$$

13 Josh and Mae work at a concession stand. They each earn \$8 per hour. Josh worked three hours more than Mae. If Josh and Mae earned a total of \$120, how many hours did Josh work?

1) 6
 2) 9
 3) 12
 4) 15

$$8j + 8m = 120$$

$$j = m + 3$$

$$8(m + 3) + 8m = 120$$

$$8m + 24 + 8m = 120$$

$$16m + 24 = 120$$

$$16m = 96$$

$$m = 6$$

$$j = m + 3 = 9$$

14 Ben has four more than twice as many CDs as Jake. If they have a total of 31 CDs, how many CDs does Jake have?

1) 9
 2) 13
 3) 14
 4) 22

$$b = 2j + 4$$

$$b + j = 31$$

$$2j + 4 + j = 31$$

$$3j + 4 = 31$$

$$3j = 27$$

$$j = 9$$

15 Three times as many robins as cardinals visited a bird feeder. If a total of 20 robins and cardinals visited the feeder, how many were robins?

- 1) 5
- 2) 10
- 3) 15
- 4) 20

$$r + c = 20$$

$$r = 3c$$

$$3c + c = 20 \quad r = 3(5)$$

$$4c = 20 \quad r = 15$$

$$c = 5$$

16 A hotel charges \$20 for the use of its dining room and \$2.50 a plate for each dinner. An association gives a dinner and charges \$3 a plate but invites four nonpaying guests. If each person has one plate, how many paying persons must attend for the association to collect the exact amount needed to pay the hotel?

- 1) 60
- 2) 44
- 3) 40
- 4) 20

$$20 + 10 + 2.50p = 3p$$

$$30 + 2.50p = 3p$$

$$30 = 0.50p$$

$$60 = p$$

17 Two numbers are in the ratio 2:5. If 6 is subtracted from their sum, the result is 50. What is the larger number?

- 1) 55
- 2) 45
- 3) 40
- 4) 35

$$1^{st} \# = 2x \rightarrow 2(8) \rightarrow 16$$

$$2^{nd} \# = 5x \rightarrow 5(8) \rightarrow 40$$

$$2x + 5x - 6 = 50$$

$$7x = 56$$

$$x = 8$$

18 The ratio of Tariq's telephone bill to Pria's telephone bill was 7:5. Tariq's bill was \$14 more than Pria's bill. What was Tariq's bill?

- 1) \$21
- 2) \$28
- 3) \$35
- 4) \$49

$$7x = \text{Tariq} \rightarrow 7(7) \rightarrow 49$$

$$5x = \text{Pria} \rightarrow 5(7) \rightarrow 35$$

$$5x + 14 = 7x$$

$$14 = 2x$$

$$7 = x$$

19 A cellular telephone company has two plans. Plan A charges \$11 a month and \$0.21 per minute. Plan B charges \$20 a month and \$0.10 per minute. After how much time, to the nearest minute, will the cost of plan A be equal to the cost of plan B?

- 1) 1 hr 22 min
- 2) 1 hr 36 min
- 3) 81 hr 8 min
- 4) 81 hr 48 min

$$11 + 0.21m = 20 + 0.10m$$

$$-11 \quad -0.10m \quad -11 \quad -0.10m$$

$$0.11m = 9$$

$$m = 81.81 \text{ min} = 1 \text{ hr. } 22 \text{ min}$$

20 At a concert, \$720 was collected for hot dogs, hamburgers, and soft drinks. All three items sold for \$1.00 each. Twice as many hot dogs were sold as hamburgers. Three times as many soft drinks were sold as hamburgers. The number of soft drinks sold was

- 1) 120
- 2) 240
- 3) 360
- 4) 480

$$d = 2h$$

$$s = 3h \rightarrow s = 3(120)$$

$$h = \text{burgers} \rightarrow s = 360$$

$$2h + 3h + h = 720$$

$$6h = 720$$

$$h = 120$$

21 Sal keeps quarters, nickels, and dimes in his change jar. He has a total of 52 coins. He has three more quarters than dimes and five fewer nickels than dimes. How many dimes does Sal have?

- 1) 13
- 2) 18
- 3) 20
- 4) 21

$$q = d + 3$$

$$n = d - 5$$

$$d = \text{dimes}$$

$$3d - 2 = 52$$

$$3d = 54$$

$$d = 18$$

$$(d) + (d + 3) + (d - 5) = 52$$

22 At Genesee High School, the sophomore class has 60 more students than the freshman class. The junior class has 50 fewer students than twice the students in the freshman class. The senior class is three times as large as the freshman class. If there are a total of 1,424 students at Genesee High School, how many students are in the freshman class?

- 1) 202
- 2) 205
- 3) 235
- 4) 236

$$s = f + 60$$

$$j = 2f - 50$$

$$sen = 3f$$

$$f + (f + 60) + (2f - 50) + (3f) = 1424$$

$$7f + 10 = 1424$$

$$7f = 1414$$

$$f = 202$$

