Regents Exam Questions A.CED.A.1: Modeling Linear Equations 1 Name: _ www.jmap.org

A.CED.A.1: Modeling Linear Equations 1

- 1 Nicci's sister is 7 years less than twice Nicci's age, *a*. The sum of Nicci's age and her sister's age is 41. Which equation represents this relationship?
 - 1) a + (7 2a) = 413) 2a 7 = 412) a + (2a 7) = 414) a = 2a 7
- 2 Kendal bought *x* boxes of cookies to bring to a party. Each box contains 12 cookies. She decides to keep two boxes for herself. She brings 60 cookies to the party. Which equation can be used to find the number of boxes, *x*, Kendal bought?
 - 1) 2x 12 = 603) 12x 24 = 602) 12x 2 = 604) 24 12x = 60
- 3 A parking garage charges a base rate of \$3.50 for up to 2 hours, and an hourly rate for each additional hour. The sign below gives the prices for up to 5 hours of parking.

Parking Rates	
2 hours	\$3.50
3 hours	\$9.00
4 hours	\$14.50
5 hours	\$20.00

Which linear equation can be used to find *x*, the additional hourly parking rate?

1) 9.00 + 3x = 20.002) 9.00 + 3.50x = 20.003) 2x + 3.50 = 14.504) 2x + 9.00 = 14.50

- 2) 9.00 + 3.50x = 20.00 4) 2x + 9.00 = 14.50
- 4 John has four more nickels than dimes in his pocket, for a total of 1.25. Which equation could be used to determine the number of dimes, *x*, in his pocket?
 - 1) 0.10(x+4) + 0.05(x) = \$1.253) 0.10(4x) + 0.05(x) = \$1.252) 0.05(x+4) + 0.10(x) = \$1.254) 0.05(4x) + 0.10(x) = \$1.25
- 5 Joe has dimes and nickels in his piggy bank totaling \$1.45. The number of nickels he has is 5 more than twice the number of dimes, *d*. Which equation could be used to find the number of dimes he has?
 - 1) 0.10d + 0.05(2d + 5) = 1.45 3) d + (2d + 5) = 1.45
 - 2) 0.10(2d+5) + 0.05d = 1.45 4) (d-5) + 2d = 1.45

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- 6 At Adelynn's first birthday party, each guest brought \$1 in coins for her piggy bank. Guests brought nickels, dimes, and quarters for a total of \$28. There were twice as many dimes as nickels and 12 more quarters than nickels. Which equation could be used to determine the number of nickels, *x*, that her guests brought to her party?
 - 1) .05x + .10x + .25x = 283) .05(2x) + .10x + .25(x + 12) = 28
 - 2) .05x + .10(2x) + .25(x + 12) = 28 4) .05(x + 12) + .10(2x) + .25x = 28
- 7 A gardener is planting two types of trees:

Type *A* is three feet tall and grows at a rate of 15 inches per year.

Type *B* is four feet tall and grows at a rate of 10 inches per year.

Algebraically determine exactly how many years it will take for these trees to be the same height.

- 8 Donna wants to make trail mix made up of almonds, walnuts and raisins. She wants to mix one part almonds, two parts walnuts, and three parts raisins. Almonds cost \$12 per pound, walnuts cost \$9 per pound, and raisins cost \$5 per pound. Donna has \$15 to spend on the trail mix. Determine how many pounds of trail mix she can make. [Only an algebraic solution can receive full credit.]
- 9 Hannah went to the school store to buy supplies and spent \$16. She bought four more pencils than pens and two fewer erasers than pens. Pens cost \$1.25 each, pencils cost \$0.55 each, and erasers cost \$0.75 each. If *x* represents the number of pens Hannah bought, write an equation in terms of *x* that can be used to find how many of each item she bought. Use your equation to determine algebraically how many pens Hannah bought.
- 10 Ian is borrowing \$1000 from his parents to buy a notebook computer. He plans to pay them back at the rate of \$60 per month. Ken is borrowing \$600 from his parents to purchase a snowboard. He plans to pay his parents back at the rate of \$20 per month. Write an equation that can be used to determine after how many months the boys will owe the same amount. Determine algebraically and state in how many months the two boys will owe the same amount. State the amount they will owe at this time. Ian claims that he will have his loan paid off 6 months after he and Ken owe the same amount. Determine and state if Ian is correct. Explain your reasoning.

A.CED.A.1: Modeling Linear Equations 1 Answer Section

1 ANS: 2 REF: 061914ai 2 ANS: 3 REF: 081616ai 3 ANS: 3 REF: 081614ai 4 ANS: 2 REF: 061416ai 5 ANS: 1 REF: 062213ai 6 ANS: 2 REF: 082404ai 7 ANS: 15x + 36 = 10x + 485x = 12*x* = 2.4 REF: 011531ai 8 ANS: $12x + 9(2x) + 5(3x) = 156\left(\frac{1}{3}\right) = 2$ pounds 45x = 15 $x = \frac{1}{3}$ REF: spr1305ai 9 ANS: 1.25x + 0.55(x + 4) + 0.75(x - 2) = 16 1.25x + 0.55x + 2.2 + 0.75x - 1.5 = 162.55x + 0.7 = 162.55x = 15.3x = 6REF: 062134ai 10 ANS: 1000 - 60x = 600 - 20x. 1000 - 60(10) = 400. Ian is incorrect because $I = 1000 - 6(16) = 40 \neq 0$

40x = 400

x = 10

REF: 011737ai