Foundations Pre Calculus 10

Name : _____ Block: _____

70

Chapter 7 Checkpoint #1 (7.1 – 7.4)

1. Identify the variables and create a linear system to model the situation.

   a) The total mass of vitamin C in one apple and two peaches is 17 mg. The total mass of vitamin C in two apples and one peach is 13 mg.

let x = mass of vitamin C in apples ✓
y = " " " " " peaches ✓

$x + 2y = 17$ ✓
$2x + y = 13$ ✓

/4

   b) Sea otters live along the coasts of California and Northern BC. The total number of sea otters is 130 000. There are twenty-five times more sea otters in Northern BC than in California.

let x = # of sea otters in California ✓
y = # of sea otters in NBC. ✓

$x + y = 130\,000$ ✓
$y = 25x$ ✓

/4

   c) The cost for theatre tickets is $20 for adults and $12 for students. $9184 was collected at the box office. 550 people attended the show.

let x = # of adult tickets ✓
y = # of student tickets ✓

$x + y = 550$ ✓
$20x + 12y = 9184$ ✓

/4

2. Verify that $(2, -1)$ is a solution to the linear system.

① $2x + y = 3$
② $4x + 3y = 5$

① $2(2) + (-1) = 3$ ✓.5
$4 - 1 = 3$
$3 = 3$ ✓.5

② $4(2) + 3(-1) = 5$ ✓.5
$8 - 3 = 5$
$5 = 5$ ✓.5

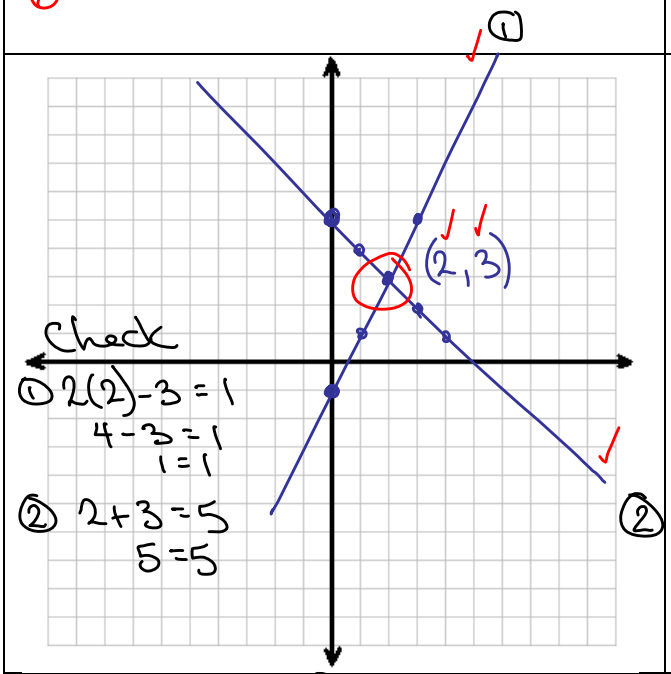
/2

/14

3. Solve the linear systems by graphing.

a) $2x - y = 1$
$x + y = 5$

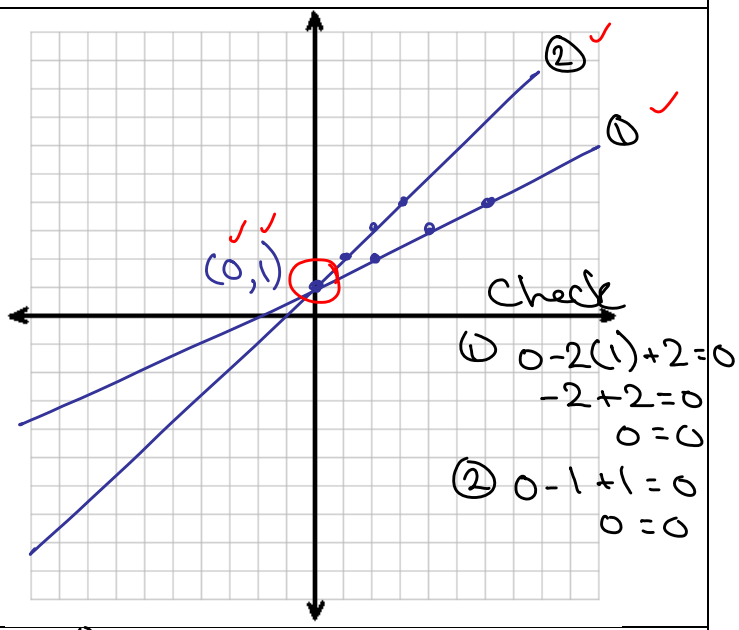
① $2x - 1 = y$
② $y = -x + 5$



Check
① $2(2) - 3 = 1$
$4 - 3 = 1$
$1 = 1$
② $2 + 3 = 5$
$5 = 5$

b) $x - 2y + 2 = 0$
$x - y + 1 = 0$

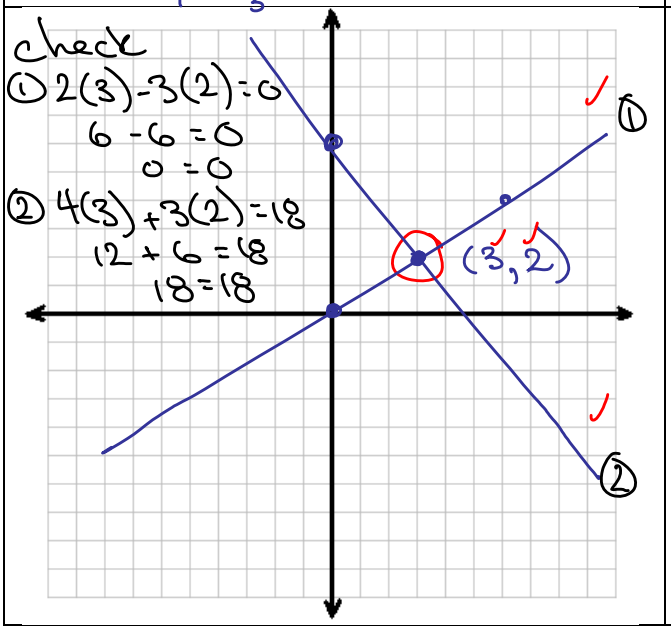
① $\frac{x}{2} + \frac{2}{2} = \frac{2y}{2} \rightarrow y = \frac{1}{2}x + 1$
② $x + 1 = y$



Check
① $0 - 2(1) + 2 = 0$
$-2 + 2 = 0$
$0 = 0$
② $0 - 1 + 1 = 0$
$0 = 0$

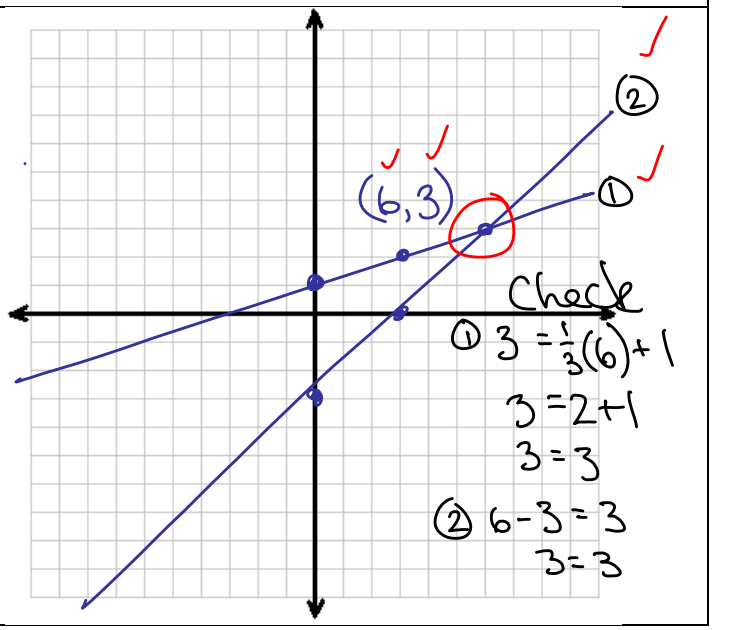
c) $2x - 3y = 0$
$4x + 3y = 18$

① $\frac{2x}{3} = y$
② $\frac{3}{3}y = -\frac{4}{3}x + \frac{18}{3}$
$y = -\frac{4}{3}x + 6$



Check
① $2(3) - 3(2) = 0$
$6 - 6 = 0$
$0 = 0$
② $4(3) + 3(2) = 18$
$12 + 6 = 18$
$18 = 18$

d) ① $y = \frac{1}{3}x + 1$
$x - y = 3$ ② $x - 3 = y$



Check
① $3 = \frac{1}{3}(6) + 1$
$3 = 2 + 1$
$3 = 3$
② $6 - 3 = 3$
$3 = 3$

/24

4. Solve the system of equations using the substitution method.

a) ① $x + 4y = 6$ → $x = 6 - 4y$ ✓ sub into ②
② $2x - 3y = 1$

$2(6-4y) - 3y = 1$ ✓
$12 - 8y - 3y = 1$
$-12 \quad\quad -12$
$-11y = -11$
$\frac{-11y}{-11} = \frac{-11}{-11}$
$y = 1$ ✓ sub into ①

$x + 4(1) = 6$
$-4 \quad -4$
$x = 2$ ✓

check:
① $2 + 4(1) = 6$
$6 = 6$ ✓
② $2(2) - 3(1) = 1$
$4 - 3 = 1$
$1 = 1$ ✓

6

b) ① $x - y = 1$ → $x = y + 1$ ✓ sub into ②
② $3x + y = 11$

$3(y+1) + y = 11$ ✓
$3y + 3 + y = 11$
$4y = 8$ ✓
$y = 2$ sub into ①

$x - 2 = 1$
$x = 3$ ✓

check:
① $3 - 2 = 1$
$1 = 1$ ✓
② $3(3) + 2 = 11$
$9 + 2 = 11$ ✓
$11 = 11$

6

c) ① $3x + 4y = 15$
② $x + y = 5$ → $x = 5 - y$ ✓ sub into ①

$3(5-y) + 4y = 15$
$15 - 3y + 4y = 15$
$y = 0$ ✓

$x + 0 = 5$
$x = 5$ ✓

check:
① $3(5) + 4(0) = 15$
$15 + 0 = 15$ ✓
② $5 + 0 = 5$
$5 = 5$ ✓

6

10

5. Cindy purchased sleeves and boxes of golf balls. Each sleeve contained 3 golf balls and each box contained 12 golf balls. Cindy purchased 7 packages for a total of 48 golf balls. How sleeves and how many boxes did she buy?

let x = # of sleeves ✓
y = # of boxes ✓

① $x + y = 7$ ✓ → $x = 7 - y$
② $3x + 12y = 48$ ✓

7

$3(7-y) + 12y = 48$
$21 - 3y + 12y = 48$
$9y = 27$
$y = 3$ ✓
$x + 3 = 7$
$x = 4$ ✓

Cindy purchased ✓
4 sleeves & 3 boxes.

Check
① $4 + 3 = 7$
$7 = 7$

② $3(4) + 12(3) = 48$
$12 + 36 = 48$
$48 = 48$

6. Tickets are sold for Safari Day at the zoo. Ben buys 5 admission tickets and 3 train ticket, he pays $65. Barb buys 2 admission tickets and 1 train ticket, she pays $25. What is the price of each ticket?

let x = $ of admission tickets ✓
y = $ of train tickets ✓

① $5x + 3y = 65$ ✓
② $2x + y = 25$ ✓
↳ $y = 25 - 2x$

$5x + 3(25 - 2x) = 65$
$5x + 75 - 6x = 65$
$-x = -10$
$x = 10$ ✓

7

$2(10) + y = 25$
$-20 \quad -20$
$y = 5$ ✓

Check: ① $5(10) + 3(5) = 65$
$50 + 15 = 65$
$65 = 65$

② $2(10) + 5 = 25$
$20 + 5 = 25$

Admission tix are $10 & ✓
train tix are $5.