Systems of Equations Practice

1. Terry has a collection of fifty basketball cards. The National Basketball Association cards are worth \$3.50 and the collegiate basketball cards are worth \$2.00 each. Terry's collection is worth \$122.50. Write and solve a system of linear equations that can be used to determine the number of each type of card Terry has. State the solution in the context of the problem.

15 X = NBA
35 y = college

$x + y = 50$ $x = 50 - y$
$3.50x + 2.00y = 122.50$
$3.50(50 - y) + 2y = 122.50$
$175 - 3.50y + 2y = 122.50$

$-1.50y = -52.50$
$y = 35$
$x + y = 50$
$x + 35 = 50$
$x = 15$

2. At the grocery store, artichokes are one price and avocados are another. Thomas buys three artichokes and one avocado for \$2.70. Cara buys one artichoke and 4 avocados for \$6.40. Write and solve a system of equations that can be used to determine the cost of artichokes and avocados. State the solution in the context of the problem.

\$.40
x artichokes
y avocados
\$1.50

$3x + y = 2.70$
$-3(1x + 4y = 6.40)$

$3x + y = 2.70$
$-3x - 12y = -19.20$
$-11y = -16.50$
$y = 1.5$

$3x + 1.5 = 2.70$
$3x = 1.20$
$x = .4$

Solve each system using any method.

3. $3x + 4y = 10$
$4x - 4y = 11$
$7x = 21$
$x = 3$
(3, 1/4)

$3x + 4y = 10$
$3(3) + 4y = 10$
$9 + 4y = 10$
$4y = 1$
$y = \frac{1}{4}$

4. $3(-2x + 5y = 15)$
$6x - 3y = 9$

$-6x + 15y = 45$
$6x - 3y = 9$
$12y = 54$
$y = 4.5$
(3.75, 4.5)

$6x - 3(4.5) = 9$
$6x - 13.5 = 9$
$6x = 22.5$
$x = 3.75$

5. $Y = 3x + 7$
$4x + 2y = 12$

$4x + 2(3x + 7) = 12$
$4x + 6x + 14 = 12$
$10x = -2$
$x = \frac{-2}{10} = -\frac{1}{5}$

$y = 3(-\frac{1}{5}) + 7$
$-\frac{3}{5} + 7$
$-\frac{3}{5} + \frac{35}{5} = \frac{32}{5}$
$6\frac{2}{5}$
$(-\frac{1}{5}, 6\frac{2}{5})$

6. $6x - 4y = 17$
$3x + 4y = 10$
$9x = 27$
$x = 3$
(3, 1/4)

$3(3) + 4y = 10$
$9 + 4y = 10$
$4y = 1$
$y = \frac{1}{4}$

7. $4x = 10y + 2$
$2y = x - 14$

$2y + 14 = x$

$2(27) + 14 = x$
$54 + 14 = x$
$68 = x$

$4(2y + 14) = 10y + 2$
$8y + 56 = 10y + 2$
$54 = 2y$
$27 = y$
(68, 27)

8. A clothing store sells shirts for one price and sweatshirts for another price. Melanie purchases two shirts and six sweatshirts for \$60. Chad purchases four shirts and three sweatshirts for \$75. Write and solve a system of linear equations that could be used to determine the cost of one shirt and one sweatshirt. State the solution in the context of the problem.

Shirts = x \$15
Sweatshirts = y \$5

$2x + 6y = 60$
$-2(4x + 3y = 75)$

$2x + 6y = 60$
$-8x - 6y = -150$
$-6x = -90$
$x = 15$

$2(15) + 6y = 60$
$30 + 6y = 60$
$6y = 30$
$y = 5$

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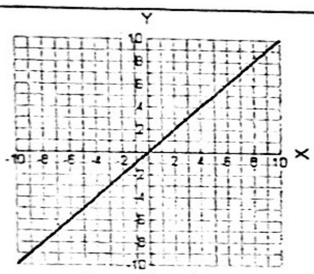
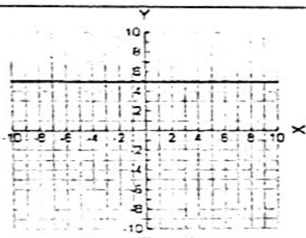
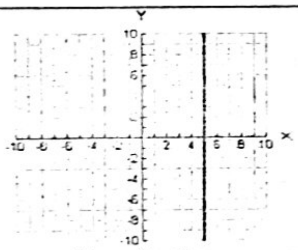
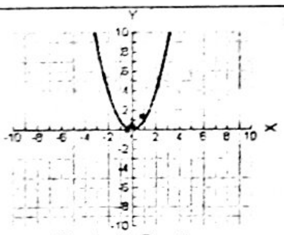
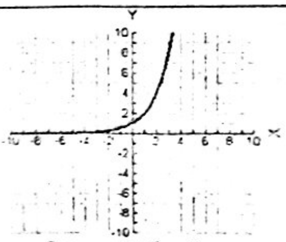
# Function Chart

**Function – for every input there is exactly one output.**

- **Domain (x's) can not repeat; must pass the vertical line test**

| Graph Looks Like | Equation | Function Name | Function – Yes or No? | Domain? Range? |
|---|---|---|---|---|
| <br>Linear Function | $y = x^1$<br>$y = 1x^1 + 0$<br>(m=1; b=0) | Linear | Yes | D = $\mathbb{R}$<br>R = $\mathbb{R}$ |
| <br>Linear Function | $y = 5$<br>(y = any number)<br>$y = 0x^1 + 5$ | Constant | Yes | D = $\mathbb{R}$<br>R = 5 |
| <br>Linear Function | $x = 5$<br>(x = any number) | Constant | No | D = 5<br>R = $\mathbb{R}$ |
| <br>Quadratic Function | $y = x^2$<br>x \| y<br>0 \| 0<br>1 \| 1<br>2 \| 4<br>3 \| 9<br>4 \| 16 | Quadratic<br>$Ax^2+Bx+C$ | Yes | D = $\mathbb{R}$<br>R = $y \geq 0$<br>or<br>$[0, \infty)$ |
| <br>Exponential Function | $y = 2^x$ | Exponential<br>$y = ab^x$ | Yes | D = $\mathbb{R}$<br>R: $y > 0$<br>$(0, \infty)$ |

$\mathbb{R}$

x | y

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( approaches