

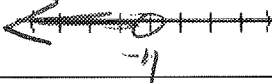
1) $4x - 3(x - 2) = 21$
 $4x - 3x + 6 = 21$
 $x = 15$

2) $7 + \frac{2}{3}x = -1$
 $\frac{2}{3}x = -8$
 $x = -12$

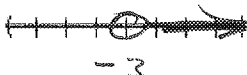
3) $12p - 7 = -3p + 8$
 $15p = 15$
 $p = 1$

4) $4 - \frac{2}{3}x = -\frac{5}{3}x - 3$
 $\frac{7}{3}x = -7$
 $x = -3$

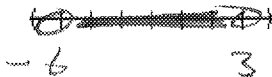
5) $-(x + 8) > 2x + 4$
 $-x - 8 > 2x + 4$
 $-12 > 3x$
 $-4 > x$



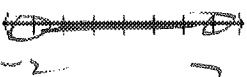
6) $7 - 3x < 16$
 $-3x < 9$
 $x > -3$



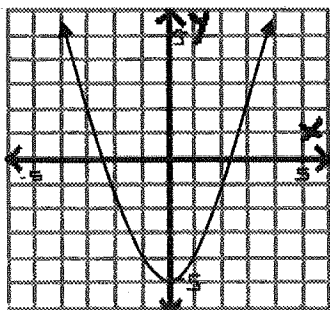
7) $13 > -2x + 1 > -5$
 $12 > -2x \rightarrow -6$
 $-6 < x < 3$



8) $-10 < 2x - 6 < 8$
 $-4 < 2x < 14$
 $-2 < x < 7$

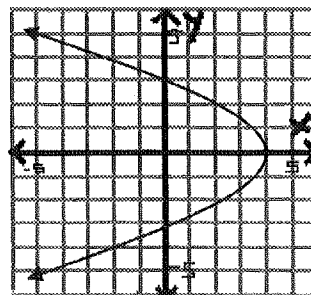


9) Is the graph a function?

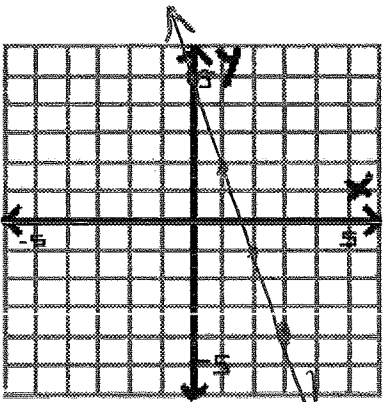
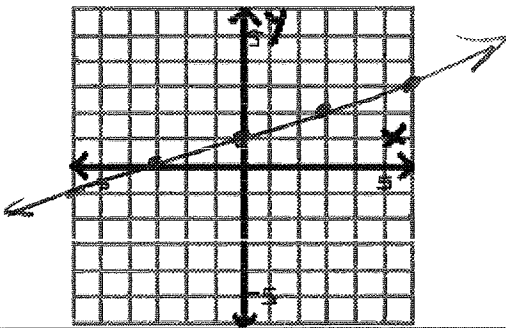
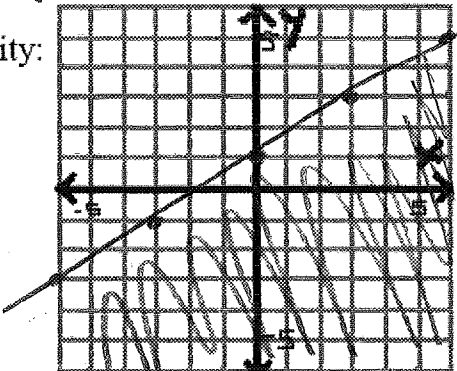
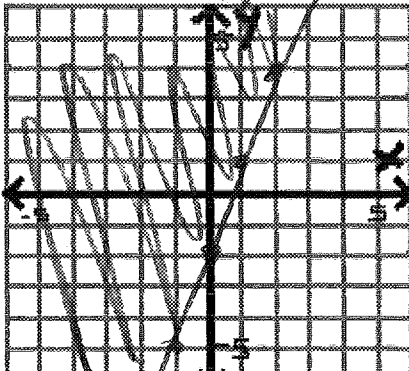


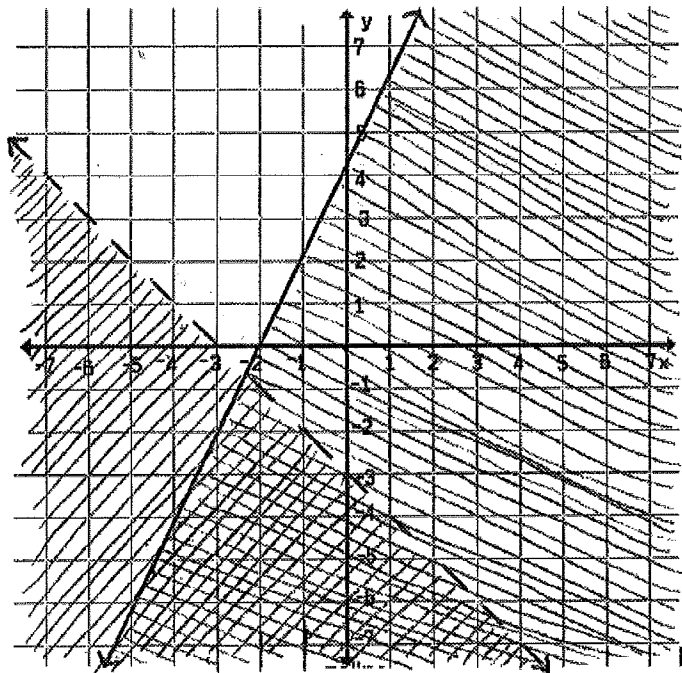
Yes

10) Is the graph a function?



No

| | |
|---|---|
| <p>11) Give the domain and range of the following set of points: (3, 7) (1, 7) (6, -2) (-8, 2)</p> <p>Domain: <u>-8, 1, 3, 6</u> Range: <u>-2, 2, 7</u> Is the relation a function? <u>yes</u></p> | <p>12) Give the domain and range of the following set of points: (6, -1) (-4, 3) (-7, -2) (6, -5)</p> <p>Domain: <u>-7, -4, 6</u> Range: <u>-5, -2, -1, 3</u> Is the relation a function? <u>no</u></p> |
| <p>13) Graph the following line from its slope and y-intercept: $y = -3x + 5$</p>  | <p>14) Graph the following line from its slope and y-intercept: $y = \frac{1}{3}x + 1$</p>  |
| <p>15) Is the point (-1, 3) a solution to the equation: $y = -4x - 1$</p> <p>$3 = -4(-1) - 1$ $3 = 4 - 1$ $3 = 3$ <u>yes</u></p> | <p>16) Name the x and y intercepts of the equation: $5x - 3y = 15$</p> <p>$\frac{x}{3} \mid \frac{y}{-5}$ \leftarrow y int (0, -5) $3 \mid 0$ \leftarrow x int (3, 0)</p> |
| <p>17) Give the equation of the line with a slope of $\frac{1}{2}$ that goes through the point (4, 3)</p> <p>$y - 3 = \frac{1}{2}(x - 4)$ $y = \frac{1}{2}x - 2 + 3$ $y = \frac{1}{2}x + 1$</p> | <p>18) Give the equation of the line that goes through the points: (-2, 3) and (2, -5)</p> <p>$m = \frac{-8}{4} = -2$ $y + 5 = -2(x - 2)$ $y = -2x - 1$</p> |
| <p>19) Graph the inequality: $3y \leq 2x + 3$</p> <p>$y \leq \frac{2}{3}x + 1$ $0 \leq 1$</p>  | <p>20) Graph the inequality: $-y \leq -3x + 2$</p> <p>$y \geq 3x - 2$ $0 \geq -2$</p>  |



21) Determine whether the following points are a solution to the system of inequalities to the right:

a) $(-2, -3)$

yes

b) $(-4, 0)$

no

c) $(-1, 2)$

no

d) $(0, -3)$

no

e) $(2, -6)$

yes

f) $(-4, 3)$

no

g) $(-4, -4)$

yes

22) Solve the following system of equations:

$$\begin{cases} y = -x + 1 \\ 2x + y = -2 \end{cases}$$

$$2x - x + 1 = -2$$

$$x = -3$$

$$y = 4$$

$$(-3, 4)$$

23) Solve the following system of equations:

$$\begin{cases} 2x + y = 4 \\ -x + y = 1 \\ x - y = -1 \end{cases}$$

$$3x = 3$$

$$x = 1$$

$$y = 1 + x = 2$$

$$(1, 2)$$

24) Solve the following system of equations:

$$\begin{cases} x + 2y = 5 \\ 5x - y = 3 \end{cases}$$

$$10x - 2y = 6$$

$$1 + 2y = 5$$

$$2y = 4$$

$$y = 2$$

$$11x = 11$$

$$x = 1$$

$$(1, 2)$$

25) Solve the following system of equations:

$$\begin{cases} 3x + 5y = 19 \\ 4x - 8y = -4 \end{cases} \quad \begin{aligned} 12x + 20y &= 76 \\ -12x + 24y &= 12 \end{aligned}$$

$$44y = 88$$

$$y = 2$$

$$3x + 10 = 19$$

$$3x = 9$$

$$x = 3$$

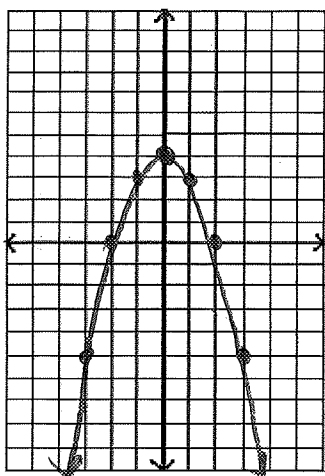
$$(3, 2)$$

| | | |
|---|---|---|
| 26) $4^2 \cdot 4^3$ 4^5 | 27) $n^3 \cdot n^3 \cdot n^4$ n^{10} | 28) $x^5 \cdot x^{-3} \cdot x^{-1}$ x |
| 29) $(-4x^3y^2)^6$ $4^6 \times 18 \times 12$ 4×6 | 30) x^0 1 | 31) $8^2 \cdot y^3 \cdot 8x^4y^6$ 8^2 $8^3 \times 9$ 8×8 |
| 32) $(3x^2y^3)^2 \cdot (2x^4y)^3$ $72x^{16}y^9$ | 33) $\frac{3x^4y}{6x^2y^3} = \frac{x^2}{2y^2}$ | 34) $\frac{m^2p^{-6}x^3}{m^{-7}p^4x^5} = \frac{m^9}{p^{10}x^2}$ |
| 35) $(9x^2 + 3x - 2) + (-x^2 - 2x + 6)$ $8x^2 + x + 4$ | 36) $(-2x^2 + 5x) - (-4x^2 - 2x + 8)$ $2x^2 + 7x - 8$ | |
| 37) $(2x - 4)(3x + 5)$ $6x^2 - 2x - 20$ | 38) $(x + 2)(3x^2 - 4x + 5)$ $3x^3 - 4x^2 + 5x$ $6x^2 - 8x + 10$ $3x^3 + 2x^2 - 3x + 10$ | |
| 39) $(x - 3)^2$ $x^2 - 6x + 9$ | 40) $(x + 7)(x - 7)$ $x^2 - 49$ | |
| 41) Factor: $3x - 9$ $3(x - 3)$ | 42) Factor: $6x^2 - 5x$ $x(6x - 5)$ | |
| 43) Factor: $x^2 - 2x - 24$ $(x - 6)(x + 4)$ | 44) Factor: $x^2 - 25$ $(x + 5)(x - 5)$ | |
| 45) Factor: $4x^2 + 28x + 49$ $(2x + 7)(2x + 7)$ $(2x + 7)^2$ | 46) Factor: $2x^3 + 10x^2 + 3x + 15$ $2x^2(x + 5) + 3(x + 5)$ $(2x^2 + 3)(x + 5)$ | |
| 47) Simplify: $\sqrt{40}$ $2\sqrt{10}$ | 48) Simplify: $\sqrt{75}$ $5\sqrt{3}$ | |

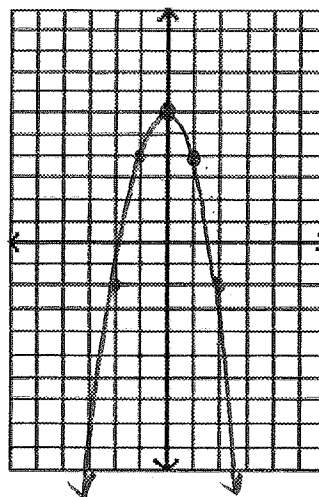
$$(x+1)(x-5)$$

$$x(x-5) + 1(x-5)$$

- 49) Use the parent graph pattern to graph: $y = -x^2 + 4$



- 50) Graph: $y = -2x^2 + 6$

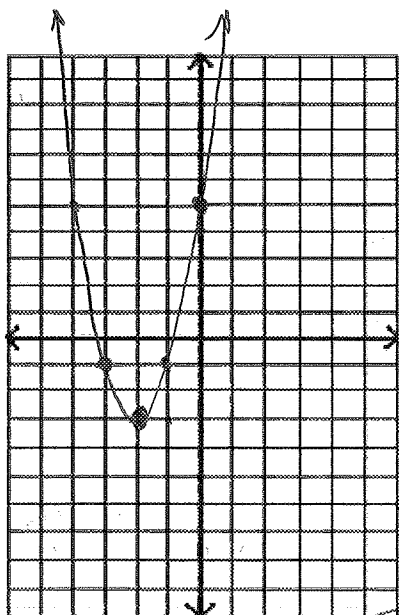


- 51) Graph and answer the questions:

$$y = 2x^2 + 8x + 5$$

$$x = \frac{-8}{2(2)} = -2$$

$$y = 8 - 16 + 5 = -3$$



Is the vertex a maximum or minimum value? $(-2, -3)$

Give the domain: All reals

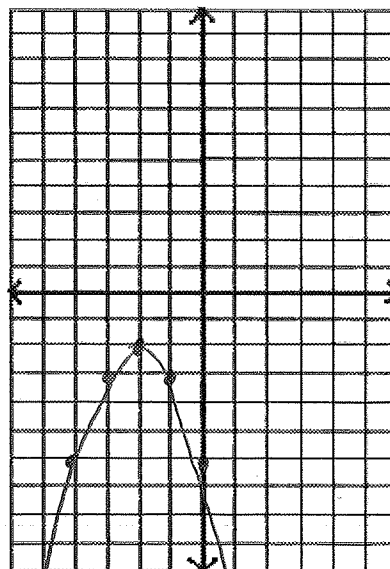
Give the range: $y \geq -3$

- 52) Graph and answer the questions:

$$y = -x^2 - 4x - 6$$

$$x = \frac{4}{2(-1)} = -2$$

$$y = -4 + 8 - 6 = -2$$



Is the vertex a maximum or minimum value? $(-2, -2)$

Give the domain: All reals

Give the range: $y \leq -2$

53) How many roots are there for the quadratic:

$$y = x^2 + 4x + 4$$

$$(x+2)^2 = 0$$

one

54) How many times does the graph of this quadratic cross the x-axis? $y = x^2 + 3x + 5$

$$9 - 4(1)(5)$$

none

55) Simplify:

$$\frac{6x+12}{x+2} = \frac{6(x+2)}{\cancel{x+2}} = 6$$

56) Simplify:

$$\frac{x^2 - 3x - 10}{x^2 - 4} = \frac{(x-5)\cancel{(x+2)}}{(\cancel{x+2})(x-2)} = \frac{x-5}{x-2}$$

57) Write the equation and solve:

Seven more than three times a number is 19. Find the number.

$$3x + 7 = 19$$

$$3x = 12$$

$$x = 4$$

58) Write the equation and solve:

Twice the sum of a number and six is 18. Find the number.

$$2(x+6) = 18$$

$$x+6 = 9$$

$$x = 3$$

59) Three consecutive even numbers have a sum of -60. What are the numbers?

$$x + x+2 + x+4 = -60$$

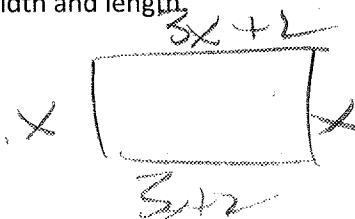
$$3x + 6 = -60$$

$$3x = -66$$

$$x = -22$$

$$-22, -20, -18$$

60) The length of a rectangle is two centimeters more than three times the width. If the perimeter is 36cm, find the width and length.



$$L = 4 \text{ cm}$$

$$W = 14 \text{ cm}$$

$$8x + 4 = 36$$

$$8x = 32$$

$$x = 4$$

61) Adult tickets to a play are \$12, student tickets are only \$8. If a theater sells 90 tickets to a play for a total of \$980, how many of each kind of ticket did the theater sell?

$$12a + 8s = 980$$

$$a + s = 90$$

$$12(90-s) + 8s = 980$$

$$1080 - 4s = 980$$

$$100 = 4s$$

$$25 = s$$

$$a = 65$$

62) Markus looked in the couch for loose change. He found 22 nickels and quarters totaling \$4.30. How many were nickels and how many were quarters?

$$n + q = 22 \rightarrow n = 22 - q$$

$$.05n + .25q = 4.30$$

$$.05(22-q) + .25q = 4.30$$

$$1.10 - .05q + .25q = 4.30$$

$$20q = 3.20$$

$$q = 16$$

$$n = 6$$

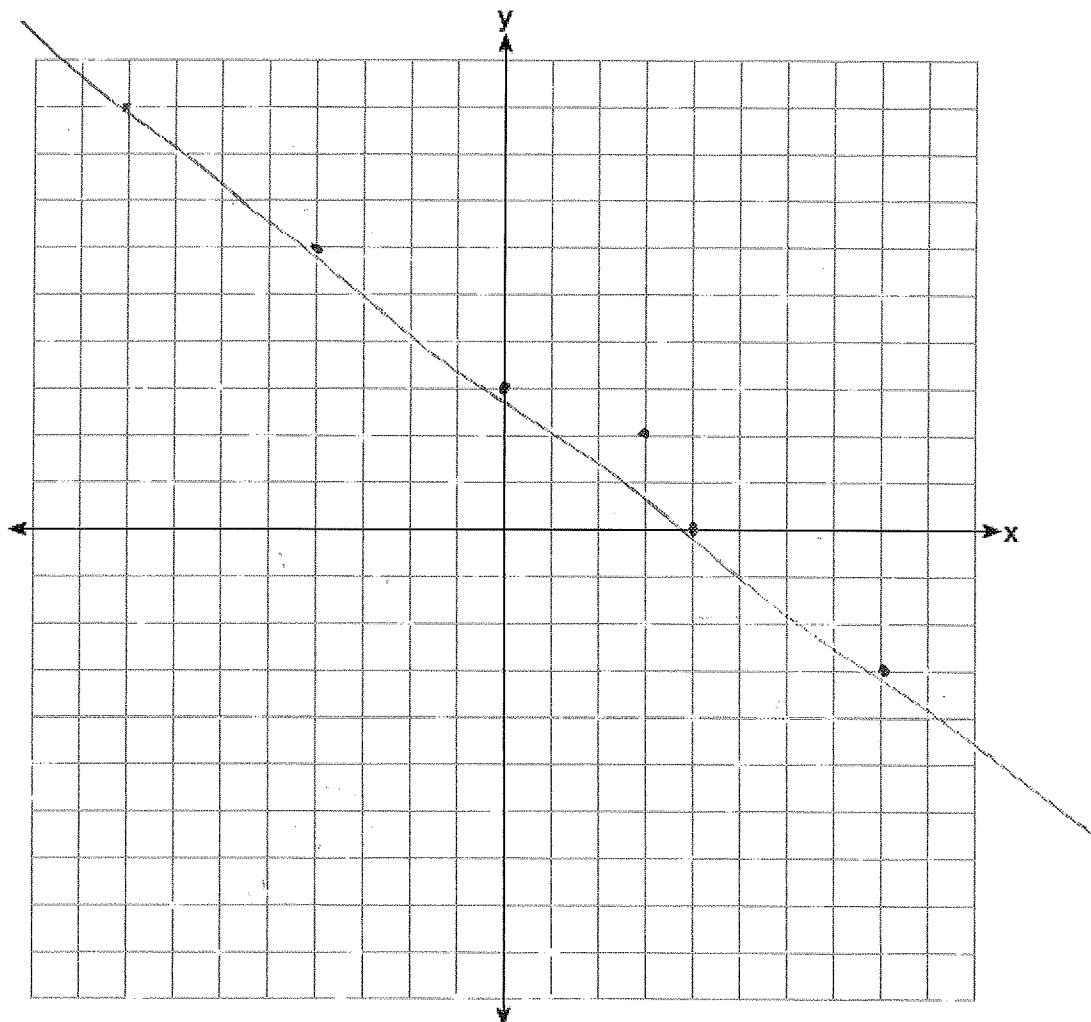
Open-ended exercises

- 63 Given $2x + ax - 7 > -12$, determine the largest integer value of a when $x = -1$.

$$\begin{aligned} -2 - a - 7 &> -12 \\ 3 &> a \\ a &< 3 \end{aligned}$$

(2)

- 64 On the set of axes below, draw the graph of the equation $y = -\frac{3}{4}x + 3$.



Is the point $(3, 2)$ a solution to the equation? Explain your answer based on the graph drawn.

no — the point $(3, 2)$ does not fall on the line, so it is not a solution to the equation

65

The function f has a domain of $\{1, 3, 5, 7\}$ and a range of $\{2, 4, 6\}$.

Could f be represented by $\{(1,2), (3,4), (5,6), (7,2)\}$?

Justify your answer.

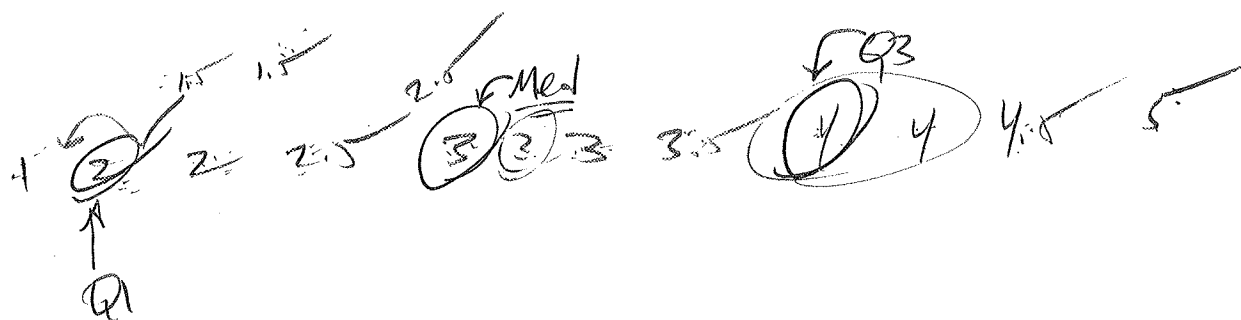
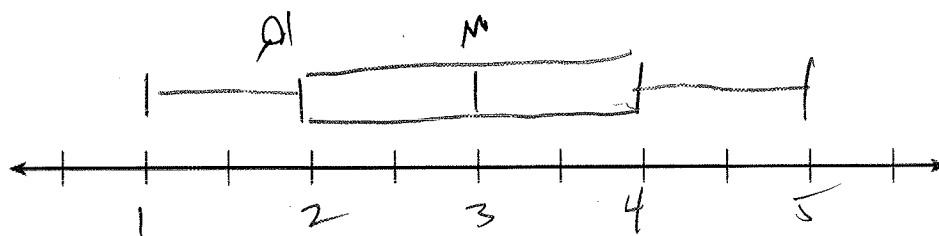
Yes — each value in domain is assigned to one and only one value in the range.

66

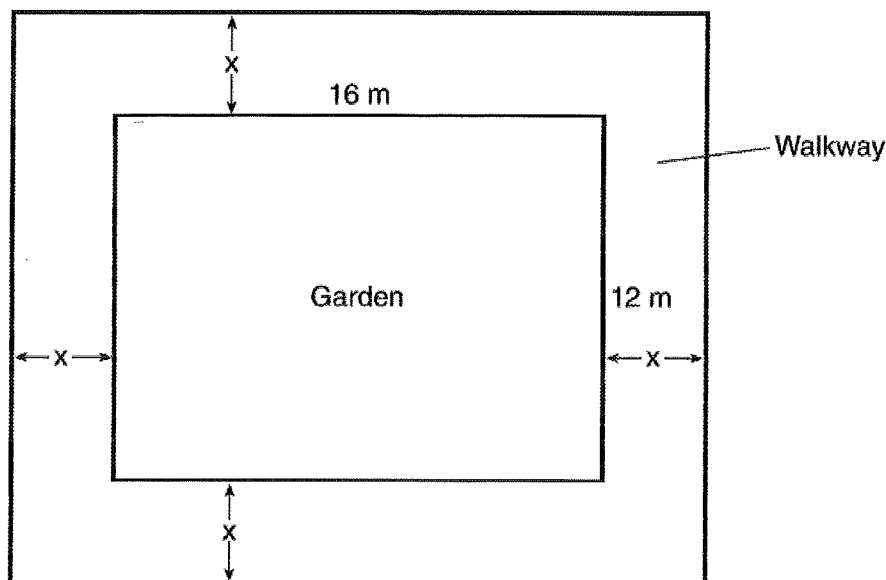
Robin collected data on the number of hours she watched television on Sunday through Thursday nights for a period of 3 weeks. The data are shown in the table below.

| | Sun | Mon | Tues | Wed | Thurs |
|--------|----------------|--------------|----------------|----------------|----------------|
| Week 1 | 4 | 3 | 3.5 | 2 | 2 |
| Week 2 | 4.5 | 5 | 2.5 | 3 | 1.5 |
| Week 3 | 4 | 3 | 1 | 1.5 | 2.5 |

Using an appropriate scale on the number line below, construct a box plot for the 15 values.



- 67 A rectangular garden measuring 12 meters by 16 meters is to have a walkway installed around it with a width of x meters, as shown in the diagram below. Together, the walkway and the garden have an area of 396 square meters.



Write an equation that can be used to find x , the width of the walkway.

$$\begin{array}{r} 2/ \\ 32 \\ \hline 56 \end{array}$$

$$(16 + 2x)(12 + 2x) = 396$$

Describe how your equation models the situation.

words

Determine and state the width of the walkway, in meters.

$$\begin{array}{r} 32 \\ 16 \\ \hline \end{array}$$

$$192 + 56x + 4x^2 = 396$$

$$4x^2 + 56x - 204 = 0$$

$$4(x^2 + 14x - 51) = 0$$

$$(x + 17)(x - 3) = 0$$

$$x = -17 \text{ or } x = 3$$

68

Caitlin has a movie rental card worth \$175. After she rents the first movie, the card's value is \$172.25. After she rents the second movie, its value is \$169.50. After she rents the third movie, the card is worth \$166.75.

Assuming the pattern continues, write an equation to define $A(n)$, the amount of money on the rental card after n rentals.

$$(0, 175)$$

$$(1, 172.25)$$

$$(2, 169.50)$$

$$(3, 166.75)$$

~~$$y = 2.75x + 175$$~~

$$y = 175 - 2.75x$$

$$A(n) = 175 - 2.75n$$

Caitlin rents a movie every Friday night. How many weeks in a row can she afford to rent a movie, using her rental card only? Explain how you arrived at your answer.

$$0 = 175 - 2.75n$$

$$\frac{2.75n}{2.75} = \frac{175}{2.75}$$

$$n \approx 63.6$$

She can afford to rent a movie with this card for 63 weeks. I substitute zero for $A(n)$ and rounded down on my answer.

69

An animal shelter spends \$2.35 per day to care for each cat and \$5.50 per day to care for each dog. Pat noticed that the shelter spent \$89.50 caring for cats and dogs on Wednesday.

Write an equation to represent the possible numbers of cats and dogs that could have been at the shelter on Wednesday.

$$c = \text{cat} \quad d = \text{dog}$$

$$2.35c + 5.50d = 89.50$$

Pat said that there might have been 8 cats and 14 dogs at the shelter on Wednesday. Are Pat's numbers possible? Use your equation to justify your answer.

$$2.35(8) + 5.50(14) = 89.50$$

$$95.8 \neq 89.50$$

no

Later, Pat found a record showing that there were a total of 22 cats and dogs at the shelter on Wednesday. How many cats were at the shelter on Wednesday?

$$c + d = 22 \xrightarrow{*-2.35} -2.35c - 2.35d = -51.7$$

$$2.35c + 5.5d = 89.50 \longrightarrow 2.35c + 5.5d = 89.5$$

$$3.15d = 37.8$$

$$d = 12$$

$$c + d = 22$$

$$c + 12 = 22$$

$$c = 10$$

There were 10 cats on Wednesday.