Name: _____ Date: _____

Regents Review: Quadratic Formula Algebra 1

Simplify the following radicals.

1. $\pm\sqrt{25}$
2. $3\sqrt{81}$
3. $\sqrt{50}$
4. $2\sqrt{18}$
5. $\sqrt{48}$
6. $\sqrt{32}$
7. $3\sqrt{36}$
8. $2\sqrt{56}$
9. $4\sqrt{98}$
10. $\sqrt{240}$
11. $-2\sqrt{108}$

Solve the following equations using the quadratic formula.

12. Solve $x^2 - 3x - 7 = 0$. Round your **solutions** to the *nearest hundredth*.

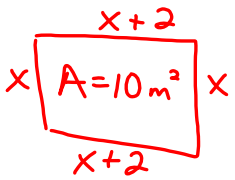
13. Solve $2x^2 - 8x = 10$. Leave your **answers** in *simplest radical form* if necessary.

14. Solve $x^2+8x-5=0$. Leave your **roots** in *simplest radical form* if necessary.

15. Solve $10=3x^2-14x$. Leave your **zeros** in *simplest radical form* if necessary.

16. Jacob wants to create a rectangular flower garden that contains an area of 10 m^2. If the length needs to be 2 meters longer than the width, determine the dimensions of the garden, *to the nearest hundredth of a meter*.

Let x = width
Let $x+2$ = Length



$A = L \cdot w$

$10 = (x+2)x$

$10 = x^2 + 2x$

$-10 \quad -10$

$0 = 1x^2 + 2x - 10$

$a=1, b=2, c=-10$

$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

$x = \frac{-2 \pm \sqrt{2^2-4(1)(-10)}}{2(1)}$

$x = \frac{-2 \pm \sqrt{4+(+40)}}{2}$

$x = \frac{-2 \pm \sqrt{44}}{2} = \frac{-2 \pm \sqrt{4}\sqrt{11}}{2}$

1
4
9
16
25
36
49

$x = \frac{-2 \pm 2\sqrt{11}}{2}$

$x = \frac{-1 \pm 1\sqrt{11}}{1}$

$x = -1+\sqrt{11}$ $\quad$ ~~$x = -1-\sqrt{11}$~~

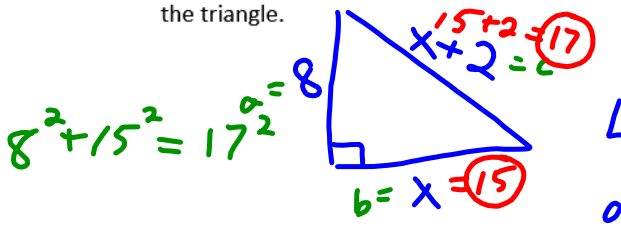
$x \approx 2.32$

$x+2 \approx 4.32$

1, 3, 5, 7, 9, 11, . . . (+2, +2)

Algebra Regents Review #2

(1) The length of the shortest side of a **right triangle** is 8 inches. The lengths of the other two sides are represented by consecutive odd integers. Find the lengths of the other sides of the triangle.



$8^2+15^2=17^2$

Let x = 1st Consec. odd Int.

Let $x+2$ = 2nd Consec. odd Int.

$a^2+b^2=c^2$

$8^2+x^2=(x+2)^2$

$(x+2)(x+2)$

$64+x^2=x^2+4x+4$

$-x^2 \quad -x^2$

$64=4x+4$

$-4 \quad -4$

$60=4x$

$\frac{60}{4}=\frac{4x}{4}$

$x=15$

	x	2
x	x^2	$2x$
2	$2x$	4

x^2+4x+4

(2) 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.]

Let x = Pounds of Almonds

Let $2x$ = " " Walnuts

Let $3x$ = " " Raisins

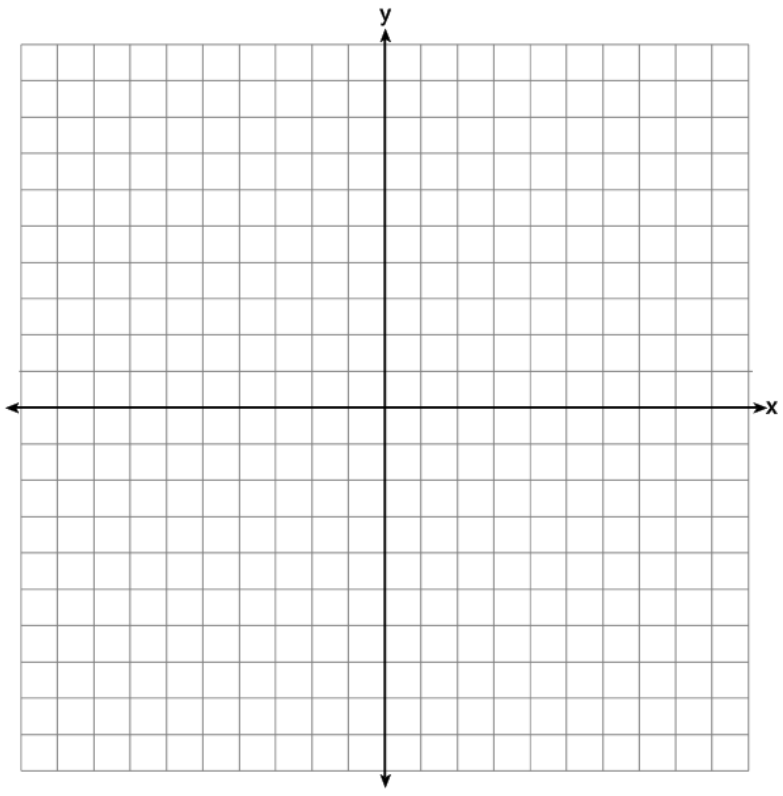
$\$12 \cdot x + \$9 \cdot 2x + \$5 \cdot 3x = \$15$

8. Next weekend Marnie wants to attend either carnival *A* or carnival *B*. Carnival *A* charges \$6 for admission and an additional \$1.50 per ride. Carnival *B* charges \$2.50 for admission and an additional \$2 per ride.

   a) In function notation, write A(x) to represent the total cost of attending carnival *A* and going on x rides. In function notation, write B(x) to represent the total cost of attending carnival *B* and going on x rides.

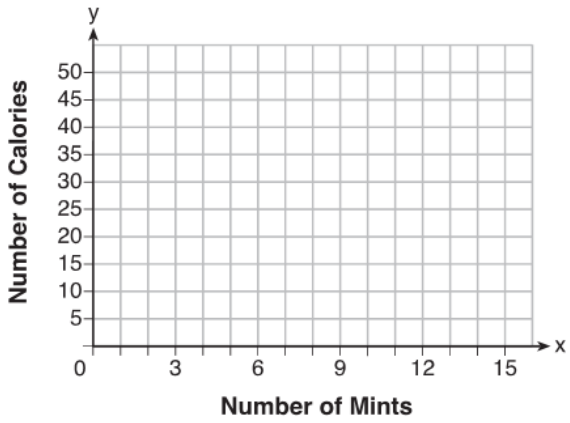
   b) Determine the number of rides Marnie can go on such that the total cost of attending each carnival is the same. [Use of the set of axes below is optional.]

   c) Marnie wants to go on five rides. Determine which carnival would have the lower total cost. Justify your answer.



8 Max purchased a box of green tea mints. The nutrition label on the box stated that a serving of three mints contains a total of 10 Calories.

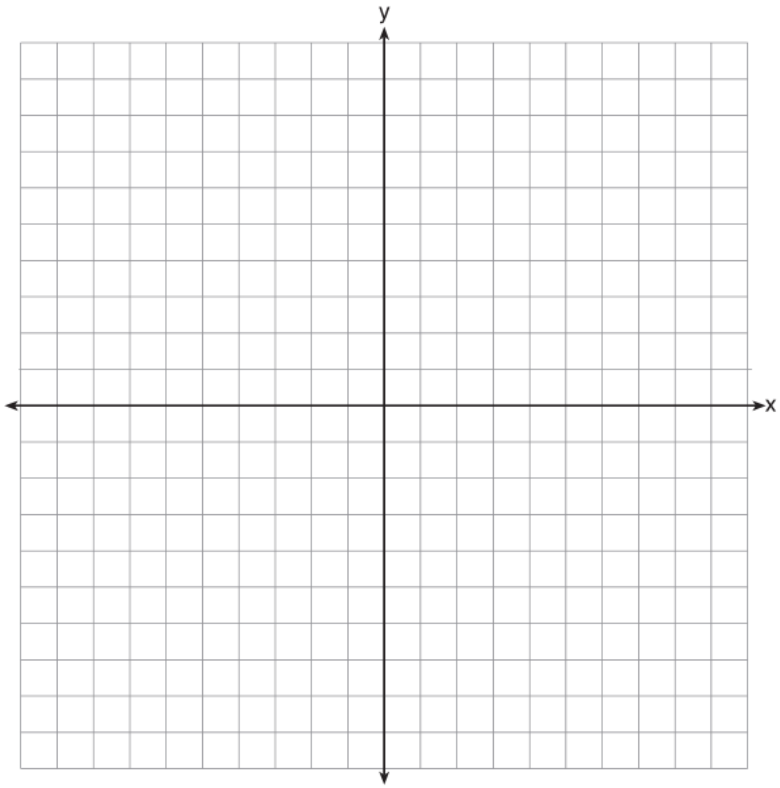
On the axes below, graph the function, C, where $C(x)$ represents the number of Calories in x mints.



Write an equation that represents $C(x)$.

A full box of mints contains 180 Calories. Use the equation to determine the total number of mints in the box.

10 On the set of axes below, graph the function $y = |x + 1|$.



State the range of the function.

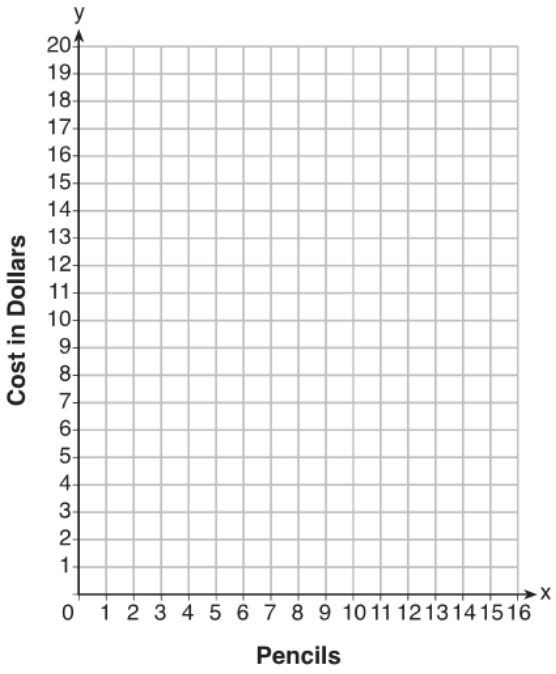
State the domain over which the function is increasing.

12 At an office supply store, if a customer purchases fewer than 10 pencils, the cost of each pencil is \$1.75. If a customer purchases 10 or more pencils, the cost of each pencil is \$1.25.

Let c be a function for which $c(x)$ is the cost of purchasing x pencils, where x is a whole number.

$$c(x) = \begin{cases} 1.75x, & \text{if } 0 \le x \le 9 \\ 1.25x, & \text{if } x \ge 10 \end{cases}$$

Create a graph of c on the axes below.



A customer brings 8 pencils to the cashier. The cashier suggests that the total cost to purchase 10 pencils would be less expensive. State whether the cashier is correct or incorrect. Justify your answer.

9 David has two jobs. He earns \$8 per hour babysitting his neighbor's children and he earns \$11 per hour working at the coffee shop.

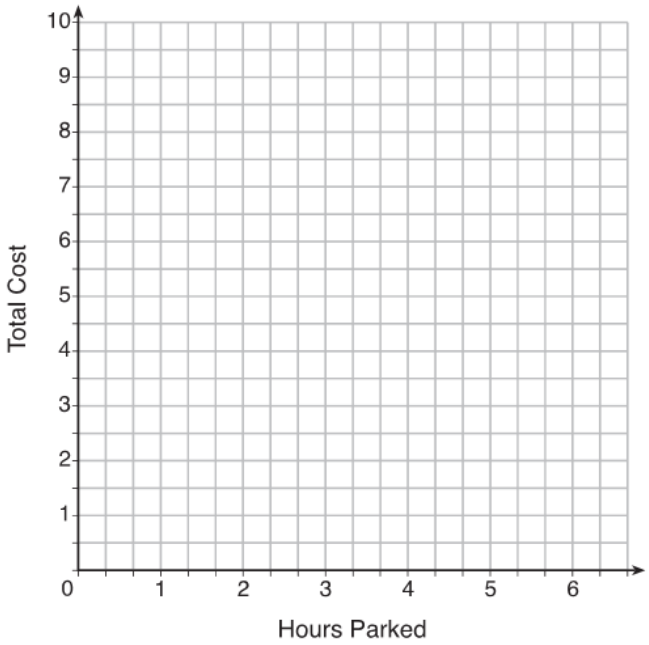
Write an inequality to represent the number of hours, x, babysitting and the number of hours, y, working at the coffee shop that David will need to work to earn a minimum of \$200.

David worked 15 hours at the coffee shop. Use the inequality to find the number of full hours he must babysit to reach his goal of \$200.

11 The table below lists the total cost for parking for a period of time on a street in Albany, N.Y. The total cost is for any length of time up to and including the hours parked. For example, parking for up to and including 1 hour would cost \$1.25; parking for 3.5 hours would cost \$5.75.

Hours Parked	Total Cost
1	1.25
2	2.50
3	4.00
4	5.75
5	7.75
6	10.00

Graph the step function that represents the cost for the number of hours parked.



Explain how the cost per hour to park changes over the six-hour period.

13 About a year ago, Joey watched an online video of a band and noticed that it had been viewed only 843 times. One month later, Joey noticed that the band's video had 1708 views. Joey made the table below to keep track of the cumulative number of views the video was getting online.

Months Since First Viewing	Total Views
0	843
1	1708
2	forgot to record
3	7124
4	14,684
5	29,787
6	62,381

a) Write a regression equation that best models these data. Round all values to the *nearest hundredth*. Justify your choice of regression equation.

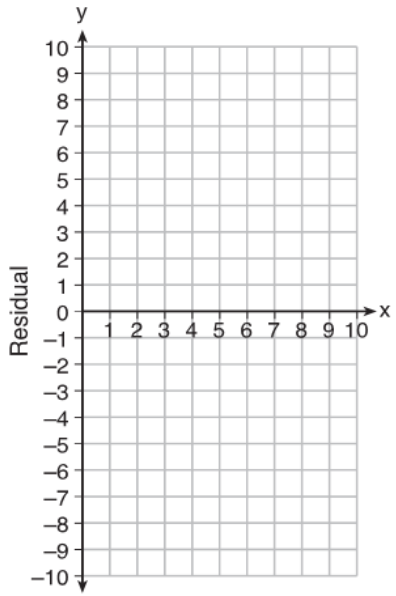
b) As shown in the table, Joey forgot to record the number of views after the second month. Use the equation from part *a* to estimate the number of full views of the online video that Joey forgot to record.

14 Use the data below to write the regression equation ($y = ax + b$) for the raw test score based on the hours tutored. Round all values to the *nearest hundredth*.

Tutor Hours, x	**Raw Test Score**	**Residual** (Actual – Predicted)
1	30	1.3
2	37	1.9
3	35	–6.4
4	47	–0.7
5	56	2.0
6	67	6.6
7	62	–4.7

Equation: _____

Create a residual plot on the axes below, using the residual scores in the table above.



Based on the residual plot, state whether the equation is a good fit for the data. Justify your answer.