

Name: Key
 Period: _____

Algebra 1 EOC Practice Test #1
 Part 2 - Calculator

1. Match each quadratic expression to its factored form.

$(2x-3)(x+5)$
 $2x^2 + 7x - 15$ B

$2(x^2 + 2x - 15)$
 $2(x+5)(x-3)$
 $2x^2 + 4x - 30$ C

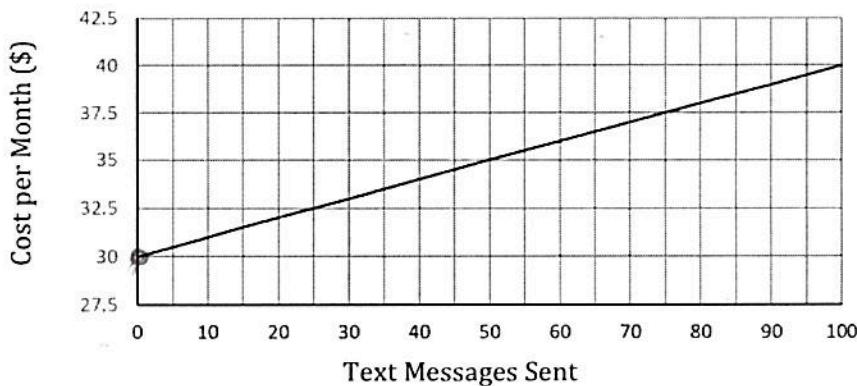
$(2x-3)(x+10)$
 $2x^2 + 17x - 30$ A

A. $(2x - 3)(x + 10)$

B. $(2x - 3)(x + 5)$

C. $2(x - 3)(x + 5)$

2. Barry has a cell phone plan that charges him a monthly fee for unlimited minutes for talking, but charges a small fee for each text message he sends. The graph shows the monthly cost for the phone based on how many text messages he sends.



What does the y-intercept of this graph represent?

- A. The cost for the cell phone plan with 100 text messages sent.
- B. The monthly fee for the cell phone plan.
- C. The cost for each text message.
- D. The total cost each month.

What is the value for the y-intercept?

$y = 30$

3. Mary is using successive approximation to determine the solution to $f(x) = g(x)$. The two functions she is using are $f(x) = x^2 - 3$ and $g(x) = 3x + 2$. Her work is shown in the table below.

x	f(x)	g(x)
2	1	8
3	6	11
→ 4	13	14
→ 5	22	17
→ 4.5	17.25	15.5

between 4 & 4.5
 $f(x) = g(x)$
 $x^2 - 3 = 3x + 2$
 $x^2 - 3x - 5 = 0$
 $3 \pm \frac{\sqrt{9 - 4(1)(-5)}}{2(1)} = \frac{3 \pm \sqrt{29}}{2}$
 $\frac{3 + 5.4}{2} \approx 4.2$
 $\frac{3 - 5.4}{2} \approx -1$

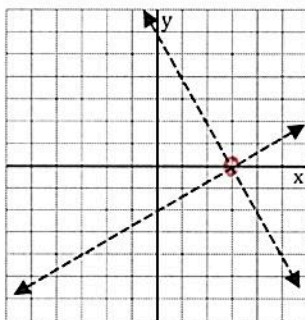
Continuing her work, what is the positive solution to the nearest tenth of $f(x) = g(x)$?

4.1 | 13.81 | 14.3
4.2 | 14.64 | 14.6

$x \approx 4.2$

4. The system of equations shown has how many solutions?

- A. Zero
- B. One**
- C. Two
- D. Infinitely many



Which of the following system of equations has the same number of solutions?

- A.** $3x + 5y = 10$
 $+ 2x + 5y = 15$
 $5x = -5$ $x = -1$
 $-3 + 5y = 10$
 $5y = 13$
 $y = 13/5$
One SOL $(-1, 13/5)$
- B. $-3x + 5y = 10$
 $+ 3x + 5y = 12$
 $0 = 12$ \emptyset - Parallel
- C. $-4x - 2y = 6$
 $-2(-2x - y = 3) + 4x + 2y = 6$ $0 = 0$ **TR** - same line
- D. $4x + 3y = 12$
 $8x + 6y = 24$
 $0 = 0$ **TR** - same line

5. A new bakery opened and has tracked its expenses and income for the first month. This data is summarized in the table below.

	Expenses	Income
Week 1	\$410.50	\$1525.24
Week 2	\$510.70	\$1765.67
Week 3	\$605.36	\$2005.08
Week 4	\$475.35	\$1709.65

2001.91 7005.64

If the bakery predicts that future months will have similar expenses and income, write an equation that could be used to determine how many months it will take the bakery to have a total income that is \$20,000 more than its total expenses. Use the variable m for the number of months and select the items from the bank to fill in the blanks (terms to the boxes and symbols to the circles).

4m	5m	2000m	7000m	20,000m	
4	5	2000	7000	20,000	
	+	-	x	÷	=

$$2000m + 20,000 = 7000m$$

$$-2000m$$

$$20,000 = 5000m$$

$$\frac{20,000}{5000} = \frac{5000m}{5000}$$

$$4 = m$$

$$2000m + 20,000 = 7000m$$

How many months does it take the income to be \$20,000 more than the expenses?

$m = 4$ months

6. Christopher is working on a project in his statistics class. He is checking his line of best fit by calculating residuals and creating a residual plot. Fill in the table with the residual values.

x	Observed Value y	Predicted Value $y = 2.03x + 3.62$	Residual Value
0	3.5	3.62	-0.12
1	5.5	5.65	-0.15
2	8.3	7.68	0.62
3	9.4	9.71	-0.31
4	11.7	11.74	-0.04

$Residual = Actual - Predicted$ (RAP)

7. Emma's has received allowance each month for five years and it has increased each year. The table below shows how much her monthly allowance is each year since it started.

Number of Years	1	2	3	4	5
Allowance (\$)	2	4	8	16	32

Write a recursive formula for finding the monthly allowance for the next year.

$a_1 = 2$

$a_n = 2a_{n-1}$

$r = 2, a_1 = 2$

$a_n = r \cdot a_{n-1}, a_1 = \#$

8. An athletic director is trying to get more people to play sports. She has done a survey on the students at her school. The table shows a portion of her data. Fill in the missing values.

	Plays Sports	Does Not Play Sports	Total
Male	153	177	330
Female	65	126	191
Total	218	303	521

What is the percentage of students who don't play sports? Round to the nearest tenth of a percent if necessary.

$\frac{303}{521} \approx 58.2\%$

9. Greg solved a quadratic equation by factoring. The problem he solved is given. Complete the four blanks shown for one of his steps and the solution. = 0

$x^2 - 10x - 5 = -29$

$(x - 6)(x - 4) = 0$

$x = 6, x = 4$

$x^2 - 10x + 24 = 0$

$(x - 6)(x - 4) = 0$

$x = 6, 4$

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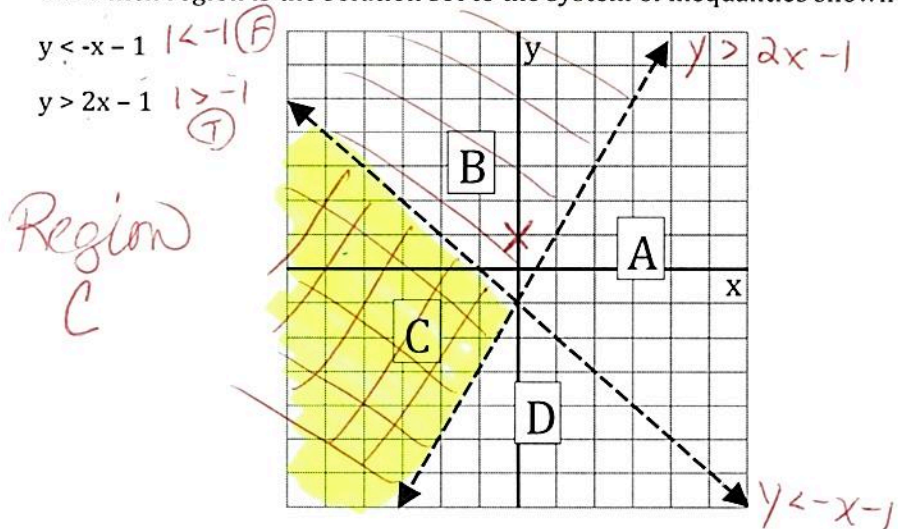
Part 2 - Calculator

10. For items that begin at rest, the distance traveled can be calculated by $d = \frac{1}{2}at^2$. The acceleration is represented by a and time by t . Solve the equation for the acceleration.

$a = \frac{2d}{t^2}$

$$\frac{d}{\frac{1}{2}t^2} = \frac{\frac{1}{2}at^2}{\frac{1}{2}t^2}$$

11. Which region is the solution set to the system of inequalities shown?



12. Abby wants to compare different equivalent forms of a quadratic equation. When given in the form of $f(x) = 3x^2 - 5x - 2$, she can easily determine the

- minimum
- maximum
- y-intercept $(0, -2)$
- zeros

She then change it to the factored form $f(x) = (3x + 1)(x - 2)$. When in this form, she can easily determine the

- minimum
- maximum
- y-intercept
- zeros $-\frac{1}{3}, 2$

13. A table of values is given for a function $f(x)$. Complete the table for $f(2x)$.

x	f(x)
-4	5
-2	7
2	1
4	-2

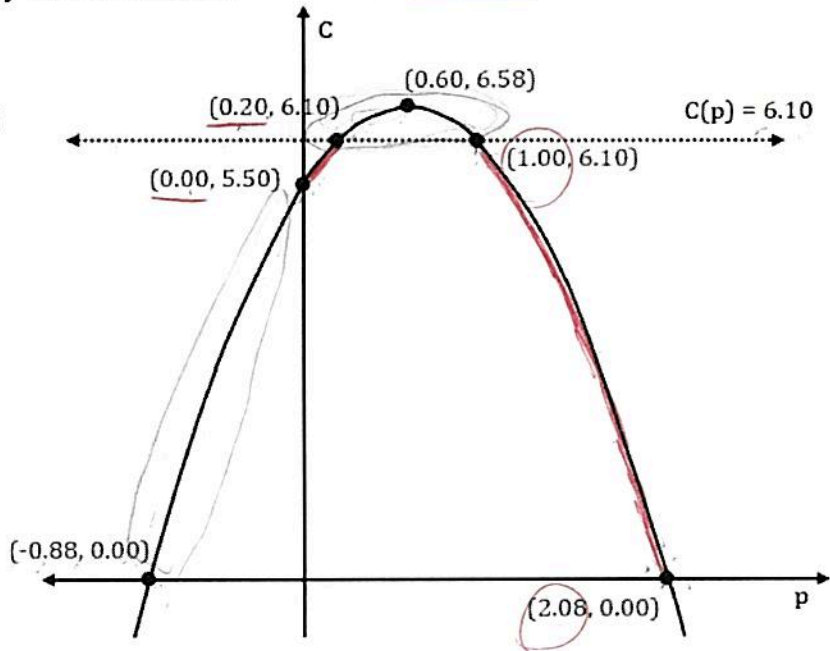
x	f(2x)
-2	5
-1	7
1	1
2	-2

x values must be divided by 2

14. Company ABC is trying to get a loan to start their new product line. They have determined that the cost (in thousands of dollars) can be modelled by the equation $C(p) = 5.5 + 3.6p - 3p^2$ where p represents the number of products created in thousands. The bank is willing to loan Company ABC up to \$6,100 to start with. How many products (in thousands) would the company be able to create?

- A. $0.00 \leq p \leq 0.20$ and $1.00 \leq p \leq 2.08$
- B. $-0.88 \leq p \leq 0.20$ and $1.00 \leq p \leq 2.08$
- C. $0.20 \leq p \leq 1.00$
- D. $0.00 \leq p \leq 2.08$

only positive #'s



15. Complete out the table for the function $f(x) = |x - 2|$.

x	f(x)
-1	3
0	2
1	1
2	0

16. Tyree is calculating the force of different objects when it hit the ground. The equation that represents this is

$$F = ma$$

where F is the force in Newtons, m is the mass in kilograms, and a is the acceleration in meters per second squared. What is the mass of an object that exerts a 70 N force and has an acceleration of 9.8 m/s^2 ? Round to the nearest tenth of a kilogram if necessary.

$$70 = m(9.8)$$

$$\frac{70}{9.8} = \frac{m(9.8)}{9.8}$$

$$7.14 \approx m$$

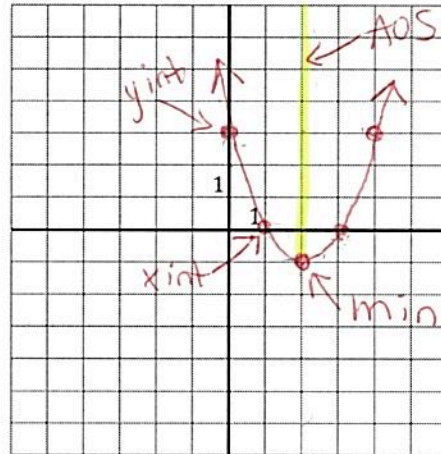
$$m \approx 7.1 \text{ kg}$$

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Part 2 - Calculator

17. Graph the function $y = x^2 - 4x + 3$.

Label the following key features: x-intercept(s), y-intercept, maximum/minimum, and axis of symmetry.



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

$$4 - 8 + 3 = -1$$

V: (2, -1)

AoS: x = 2

y-int: (0, 3)
(1, 0) 1-4+3

x	y
0	3
1	0
2	-1
3	0
4	3

18. Scott has invested money in a savings account that earns 8.5% interest per year. The interest is compounded quarterly. An expression that represents the change based on the number of years t is $(1 + \frac{0.085}{4})^{4t}$.

Does this exponential equation represent growth or decay?

Growth

What is the percent rate of change each year? (Round to the nearest hundredth)

move 2 spaces right

8.78%

$$(1 + 0.02125)^{4t}$$

$$(1.02125)^{4t}$$

$$(1.08775)^t$$

growth

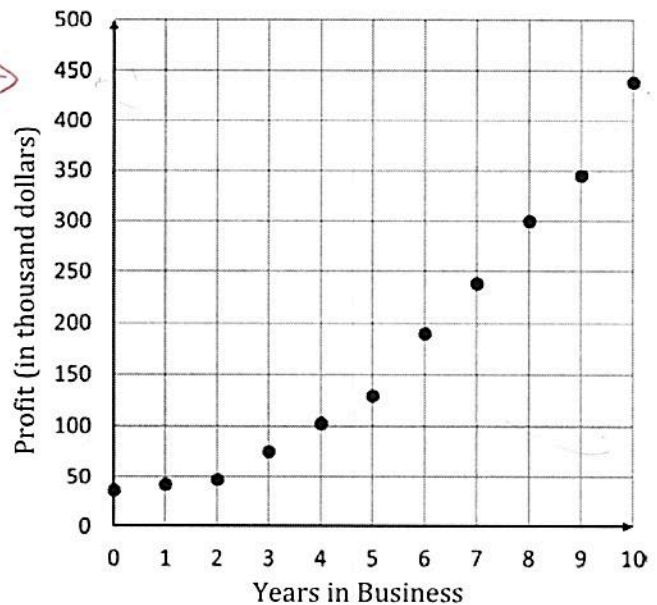
19. Ten years ago, Sean started an engineering company. The company has expanded and increased profits. The profit a company has made is shown on the scatterplot provided.

Which of the following functions is the best model for the data shown?

- A. $P(t) = 35 + 4.1x$
- B. $P(t) = 35 - 4x^2$
- C. $P(t) = 35 + 4x^2$
- D. $P(t) = 35 - 4.1x$

A & D are linear

- EXP Model
- It's positive



Based on the function you chose, what is the predicted profit in thousand dollars for year 15? (Round to the nearest tenth if necessary)

$$P(15) = 35 + 4(15^2)$$

$$35 + 4(225)$$

$$P(15) = 935$$

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Part 2 - Calculator

20. The system of equations $\begin{cases} x - 2y = -4 \\ x + y = 5 \end{cases}$ has the solution (2, 3). Which of the following systems would have the same solution? Select all that apply.

$\begin{cases} x - 2y = -4 \\ -x - y = -5 \end{cases}$ $\begin{cases} -3y = -9 \\ y = 3 \end{cases}$ $\begin{cases} x - 6 = 4 \\ x = 2 \end{cases}$

$\begin{cases} x - 2y = -4 \\ 2x + 2y = 5 \end{cases}$ $3x = 1$

$\begin{cases} x - 2y = -4 \\ 2x + 2y = 10 \end{cases}$ $\begin{cases} 3x = 6 \\ x = 2 \end{cases}$ $\begin{cases} 2y = 6 \\ y = 3 \end{cases}$

$\begin{cases} -2x + 4y = 78 \\ 2x + 2y = 5 \end{cases}$ $6y = 13$

$\begin{cases} 2x - 4y = -8 \\ -2x - 2y = -10 \end{cases}$ $\begin{cases} -6y = -18 \\ y = 3 \end{cases}$ $\begin{cases} 2x = 4 \\ x = 2 \end{cases}$

21. Solve the inequality for x.

$2x + 5 < 5x - 4$
 $-2x \quad -2x$

- A. $x > 3$
- B. $x < 3$
- C. $x > \frac{9}{7}$
- D. $x < \frac{9}{7}$

$5 < 3x - 4$
 $+4 \quad +4$
 $9 < 3x$
 $3 < x$
 $x > 3$

22. A manufacturer is trying to determine the volume (in cubic centimeters) 60 boxes of a product will take up in a shipping truck. The volume can be modeled by the function $V(s) = 60s^3$, where s represents the length of all sides of the box in centimeters. What is $V(6)$?

$V(6) = 12,960$ $V(6) = 60(6^3)$
 $60(216) = 12,960$

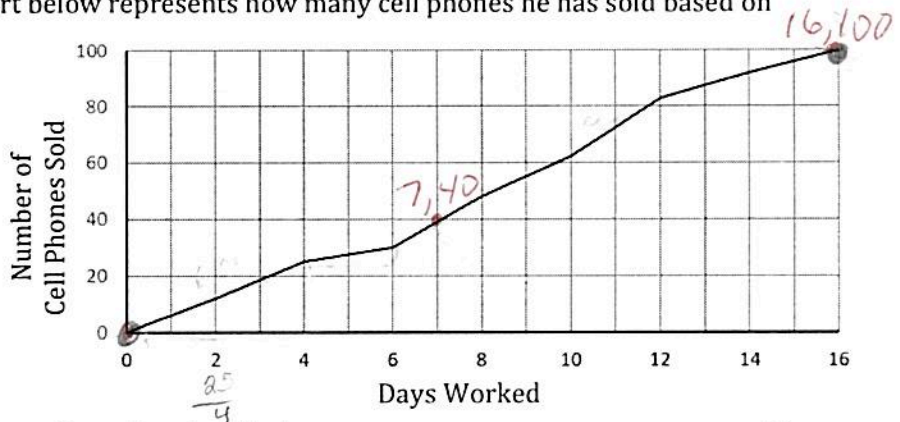
23. Michael works at a cell phone store. The chart below represents how many cell phones he has sold based on how many days he has worked.

What is the average rate of change?

- A. 0.16
- B. 0.10
- C. 6.25
- D. 8.36

$(16, 100) (0, 0)$
 $\frac{0 - 100}{0 - 16} = \frac{-100}{-16} = 6.25$

$\frac{40 - 0}{7 - 0} = \frac{40}{7}$
 $\frac{100 - 40}{16 - 7} = \frac{60}{9}$
 6.25



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Part 2 - Calculator

24. An air conditioning repair company has a flat service fee and charges an hourly rate. One customer pays \$180 for two hours of work and another pays \$230 for three hours of work. Write a linear function for this situation (use h for the number of hours).

$C(h) = 50h + 80$

(hours, cost)
 $(2, 180)$ $(3, 230)$
 $y = mx + b$
 $180 = 50(2) + b$
 $180 = 100 + b$ $b = 80$
 $\frac{230 - 180}{3 - 2} = \frac{50}{1}$
 $y = 50x + 80$

25. Melissa is given the function $f(x) = 2x^2 + 5x + 2$ and told it has two zeros.

What is one of the two zeros?

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

What do the zeros represent? Select all that apply.

- The $f(x)$ value at the minimum
- The x value(s) when it crosses the x -axis
- The x value(s) at the minimum
- The x value(s) when $f(x) = 0$
- The y -intercept(s)



$y(\text{int})$
 initial value
 growth rate

26. Sebastian works at a company doing graphic design. His starting salary is \$36,000 and increases by 3% each year. Write an exponential function for his salary as dependent on the y number of years he has worked.

$S(y) = 36,000(1.03)^y$

27. A table of values for the function $f(x)$ is given.

x	$f(x)$
-3	5
-2	7
-1	4
0	-2
1	3

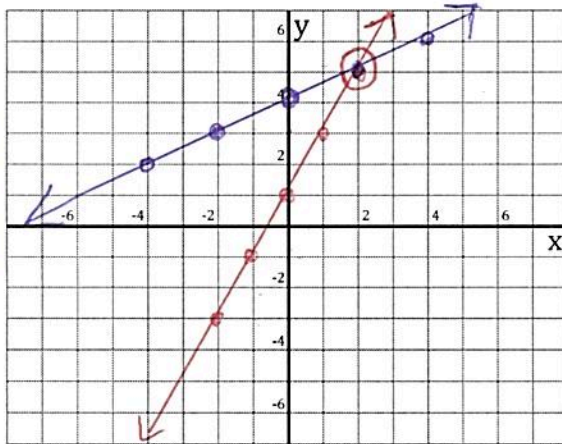
Select all the ordered pairs that are a solution to the function.

- (0, -2)
- (2, 7)
- (5, -3)
- (3, 1)
- (4, -1)
- (-3, -2)

only ordered pair on the table

28. Graph the system of equations to determine the solution.

$y = 2x + 1$
 $3x - 6y = -24$
 $\frac{-6y}{-6} = \frac{-3x - 24}{-6} = \frac{-3x - 24}{-6}$
 $y = \frac{1}{2}x + 4$



What is the solution? **(2, 5)**

29. Chloe was comparing her 50-yard freestyle times from her freshman and sophomore years. The times are shown.

Freshman Year: 43, 45, 41, 42, 46, 41
 Sophomore Year: 39, 43, 45, 41, 40, 38

Answer bank:	1.5	2	2.5	3	Fewer	More
Lower Quartile					Upper Quartile	
Interquartile Range					Range	

The mean for her freshman year is 2 more than her sophomore year. *Mean 43 - F, Mean 41 - S*

The median for her freshman year is 2 more than her sophomore year. *Median 42.5 - F, Median 40.5 - S*

The IQR is the same for both sets of data. *(4) 45 - 41, 43 - 39*

30. Jennifer kicks a soccer ball into the air. The height of the ball in feet can be approximated using the equation $h(t) = 30t - 15t^2$ where t is time in seconds. To determine how long the ball is in the air, she would need to calculate what?

- minimum
- maximum
- y-intercept
- zero

$\frac{-30}{2(-15)} = 1$ *2 sec*
 $30 - 15 = 15$ *max height*
 $30t - 15t^2 = 0$
 $15t(2 - t) = 0$

Which equation is a step in finding the solution to how long the ball is in the air?

- $h(3) = 30(3) - 15(3)^2$
- $0 = 15t(2 - t)$
- $h(0) = 30(0) - 15(0)^2$
- $h(t) = -15(t - 1)^2 + 15$

$2 - t = 0$
 $-t = -2$
 $t = 2$

