

# I ALGEBRA I

Wednesday, June 19, 2019 — 1:15 to 4:15 p.m., only

Student Name

Key

School Name

The possession or use of any communications device is strictly prohibited when taking this examination. If you have or use any communications device, no matter how briefly, your examination will be invalidated and no score will be calculated for you.

Print your name and the name of your school on the lines above.

A separate answer sheet for Part I has been provided to you. Follow the instructions from the proctor for completing the student information on your answer sheet.

This examination has four parts, with a total of 37 questions. You must answer all questions in this examination. Record your answers to the Part I multiple-choice questions on the separate answer sheet. Write your answers to the questions in Parts II, III, and IV directly in this booklet. All work should be written in pen, except for graphs and drawings, which should be done in pencil. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily drawn to scale.

The formulas that you may need to answer some questions in this examination are found at the end of the examination. This sheet is perforated so you may remove it from this booklet.

Scrap paper is not permitted for any part of this examination, but you may use the blank spaces in this booklet as scrap paper. A perforated sheet of scrap graph paper is provided at the end of this booklet for any question for which graphing may be helpful but is not required. You may remove this sheet from this booklet. Any work done on this sheet of scrap graph paper will not be scored.

When you have completed the examination, you must sign the statement printed at the end of the answer sheet, indicating that you had no unlawful knowledge of the questions or answers prior to the examination and that you have neither given nor received assistance in answering any of the questions during the examination. Your answer sheet cannot be accepted if you fail to sign this declaration.

Notice ...  
A graphing calculator and a straightedge (ruler) must be available for you to use while taking this examination.

DO NOT OPEN THIS EXAMINATION BOOKLET UNTIL THE SIGNAL IS GIVEN.

I ALGEBRA I

Part I

Answer all 24 questions in this part. Each correct answer will receive 2 credits. No partial credit will be allowed. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily drawn to scale. For each statement or question, choose the word or expression that, of those given, best completes the statement or answers the question. Record your answers on your separate answer sheet. [48]

1 The expression  $w^4 - 36$  is equivalent to

- (1)  $(w^2 - 18)(w^2 - 18)$   
(2)  $(w^2 + 18)(w^2 - 18)$

perfect squares  
(3)  $(w^2 - 6)(w^2 - 6)$   
(4)  $(w^2 + 6)(w^2 - 6)$

Use this space for computations.

2 If  $f(x) = 4x + 5$ , what is the value of  $f(-3)$ ?

- (1) -2  
(2) -7

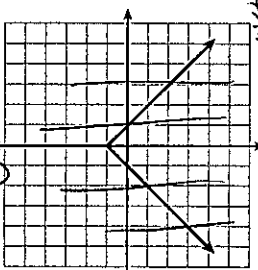
- (3) 17  
(4) 4

$f(x) = 4x + 5$   
 $f(-3) = 4(-3) + 5 = -12 + 5 = -7$   
 $f(-3) = -7$

See what y is to when x = -3

3 Which relation is not a function?

x	y
-10	-2
-6	2
-2	6
1	9
5	13



(1) Function

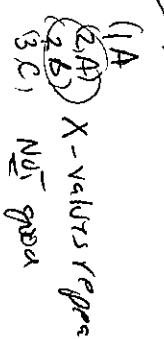
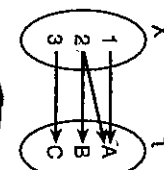
(2) Function

(3) NOT a function

(4) NOT a function

function: each element of the domain corresponds with 1 + only 1 element of the range  
X-values don't repeat

X-values don't repeat = good ✓



function  
 $3x + 2y = 4$   
 $-3x \quad -3x$   
 $\frac{2y}{2} = \frac{-3x + 4}{2}$   
 $y = -\frac{3}{2}x + 2$

Algebra I - June 19 [2]

passes the vertical line test. = good ✓

passes the vertical line test = good ✓  
each vertical line goes through the graph 1 time

NOT a function

rules:  
 + inside = left  
 - inside = right  
 + outside = up  
 - outside = down

$-2 \text{ to } -5 \text{ is } -3$   
 $8x - 2 - 3 = -5$

4 Given:  $f(x) = (x-2)^2 + 4$   
 $g(x) = (x-5)^2 + 4$   
 DFF 15.3.1.5

When compared to the graph of  $f(x)$ , the graph of  $g(x)$  is  
 (A) shifted 3 units to the left  
 (B) shifted 5 units to the left  
 (C) shifted 3 units to the right  
 (D) shifted 5 units to the right

Use this space for computations.  
 Subtracting on the inside means move to the right  
 \*then plug both in to  $y^2$  to see the shift

5 Students were asked to write  $6x^5 + 8x - 3x^3 + 7x^7$  in standard form.  
 Shown below are four student responses:

- (1) Anne:  $7x^7 + 6x^5 - 3x^3 + 8x$
- (2) Bob:  $-3x^3 + 6x^5 + 7x^7 + 8x$
- (3) Carrie:  $8x + 7x^7 + 6x^5 - 3x^3$
- (4) Dylan:  $8x - 3x^3 + 6x^5 + 7x^7$

Which student is correct?

- (1) Anne
- (2) Bob
- (3) Carrie
- (4) Dylan

Descending power order: exponents  
 go from largest to smallest  
 (combine all like terms & write in DFO)

6 The function  $f$  is shown in the table below.

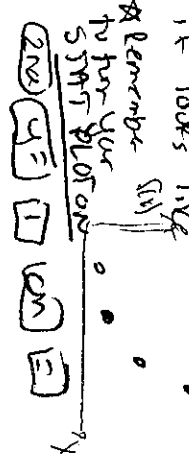
x	f(x)
0	1
1	3
2	9
3	27

Which type of function best models the given data?

- (1) exponential growth function
- (2) exponential decay function
- (3) linear function with positive rate of change
- (4) linear function with negative rate of change

The rate of change is NOT constant as the 1st try so it can NOT be linear

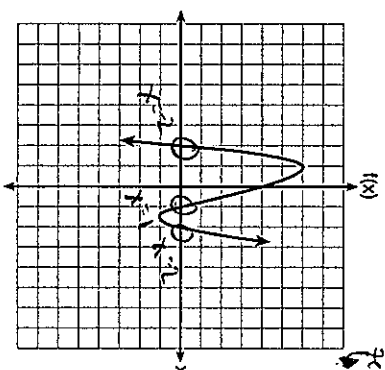
The #'s triple  
 you can also put it in to calc L1 L2  
 go to ZOOM 9: ZOOM STMT to observe  
 it looks like  
 Remember to put your STMT PLOT on



Can be written as  
 The ratio of 2 integers where the denominator is NOT 0.

Decimal: representing a terminating  
 Use this space for computations.

7 Which expression results in a rational number?  
 (1)  $\sqrt{2} \cdot \sqrt{8} = \sqrt{16} = 4$   
 (2)  $5 \cdot \sqrt{5} = 5\sqrt{5}$   
 (3)  $1\sqrt{2} + \sqrt{2} = 2\sqrt{2} = 2.82842712475...$   
 (4)  $3\sqrt{2} + 5\sqrt{3}$   
 Irrational: 1.180339875...  
 Can't add = 7.70674230726...  
 Zero  
 A polynomial function is graphed below.



Roots:  $x = -2$ ,  $x = 1$   
 Factors:  $(x+2)(x-1)$   
 can also check w/ calc  
 plug in to  $y =$  then look for  
 or  $(x-2)(x+2)$  look for  
 or  $(x+2)(x-1)$  look for  
 or  $(x-2)(x-1)$  look for

Which function could represent this graph?

- (1)  $f(x) = (x+1)(x^2 + 2)$
- (2)  $f(x) = (x-1)(x^2 - 4)$
- (3)  $f(x) = (x-1)(x^2 - 4)$
- (4)  $f(x) = (x+1)(x^2 + 4)$

9 When solving  $p^2 + 5 = 8p - 7$ , Kate wrote  $p^2 + 12 = 8p$ . The property she used is

- (1) the associative property  $(a+b)+c = a+(b+c)$
- (2) the commutative property  $a+b = b+a$
- (3) the distributive property  $a(b+c) = ab+ac$
- (4) the addition property of equality

$p^2 + 5 = 8p - 7$   
 $p^2 + 12 = 8p$   
 Add 7 to both sides of the equation.

10 David wanted to go on an amusement park ride. A sign posted at the entrance read "You must be greater than 42 inches tall and no more than 57 inches tall for this ride." Which inequality would model the height  $x$ , required for this amusement park ride?

- (1)  $42 < x \leq 57$
- (2)  $42 > x \geq 57$
- (3)  $42 < x$  or  $x \leq 57$
- (4)  $42 > x$  or  $x \geq 57$

$x > 42$   
 $x \leq 57$   
 Use this space for computations.  
 Asking in between means the 'x' is in between  
 42 inches to 57 inches

11 Which situation can be modeled by a linear function?

- (1) The population of bacteria triples every day → exponential growth
- (2) The value of a cell phone depreciates at a rate of 3.5% each year → exponential decay
- (3) An amusement park allows 50 people to enter every 30 minutes → constant rate of change
- (4) A baseball tournament eliminates half of the teams after each round → exponential decay

12 Jenna took a survey of her senior class to see whether they preferred pizza or burgers. The results are summarized in the table below.

	Pizza	Burgers	Total
Male	23	42	65
Female	31	28	59
Total	54	70	124

Denominator  
 (Circle) the people who preferred burgers approximately what percentage were female?

- (1) 21.3
- (2) 38.2
- (3) 45.6
- (4) 61.9

$\frac{26}{68} = \frac{38.2\%}{100}$   
 $\frac{26}{68} = \frac{x}{100}$   
 $2600 = 68x$   
 $x = 38.2\%$

13 When  $3a + 7b > 2a - 8b$  is solved for  $a$ , the result is

- (1)  $a > -b$
- (2)  $a < -b$
- (3)  $a < -15b$
- (4)  $a > -15b$

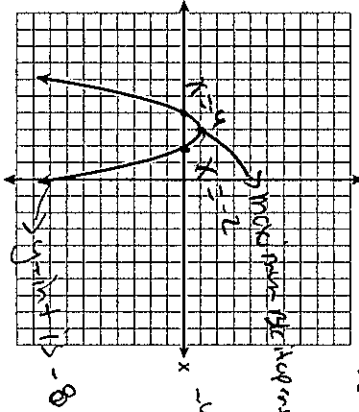
$3a + 7b > 2a - 8b$   
 $-2a$   
 $a + 7b > -8b$   
 $-7b$   
 $a > -15b$

14 Three functions are shown below.

Linear:  $A: g(x) = -\frac{3}{2}x + 4$

Quadratic:  $B: f(x) = (x+2)(x+6)$

Quadratic:  $C: h(x) = x^2 - 10x + 15$



Use this space for computations.  
 Roots  
 You can find roots for factoring you graph on the calculator  
 graph on the calculator

Which statement is true?

- (1) B and C have the same zeros. 1, 2, 3, but NOT 5, 12
- (2) A and B have the same y-intercept.  $A = 4$   $B = 12$   $C = -4$
- (3) B has a minimum and C has a maximum.
- (4) C has a maximum and A has a minimum.

15 Nicci's sister is 7 years less than Nicci's age. The sum of Nicci's age and her sister's age is 41. Which equation represents this relationship?

- (1)  $a + (7 - 2a) = 41$
- (2)  $a + (2a - 7) = 41$
- (3)  $2a - 7 = 41$
- (4)  $a = 2a - 7$

$a = \text{Nicci's age}$   
 $2a - 7 = \text{Nicci's sister's age}$   
 $a + 2a - 7 = 41$

16 The population of a small town over four years is recorded in the chart below, where 2013 is represented by  $x = 0$ . Population is rounded to the nearest person.

Year	2013	2014	2015	2016
Population	3810	3943	4081	4224

The population,  $P(x)$ , for these years can be modeled by the function  $P(x) = ax^2 + bx + c$ , where  $b$  is rounded to the nearest thousandth. Which statements about this function are true?  
 I.  $a = 3810$  → stacking value (when  $x=0$ )  
 II.  $a = 0.035$  → Decay  
 III.  $b = 1.035$  → Growth  
 IV.  $b = 1.035$  → Growth

- (1) I and III
- (2) I and IV
- (3) II and III
- (4) II and IV

17 When written in factored form,  $3w^2 - 11w + 8$  is equivalent to

- (1)  $(2w + 1)(2w - 3)$
- (2)  $(2w - 1)(2w + 3)$
- (3)  $(4w + 1)(w - 3)$
- (4)  $(4w - 1)(w + 3)$

18 Which ordered pair does not represent a point on the graph of the equation  $4x + 3y = 12$ ?

- (1)  $(-1.5, 15.25)$
- (2)  $(0.5, 7.25)$
- (3)  $(1.25, 10.25)$
- (4)  $(2.5, 23.25)$

19 Given the following three sequences:

- Seq 1:  $2, 4, 6, 8, 10, \dots$
- Seq 2:  $1, 4, 9, 16, 25, \dots$
- Seq 3:  $1, 2, 4, 8, 16, 32, \dots$

- (1) I and II, only
- (2) I and III, only
- (3) II and III, only
- (4) I, II, and III

Answer key = linear = Add  
 Geometric = Exponential = Multiply

Use this space for computations.

STA-1:  $Ea \cdot x$   
 STA-7:  $(a+c) \cdot 0$ : Expressions

$y = 3809.86 \cdot 9249 \cdot 1.03498^{4x}$   
 $a = 3810$   
 $b = 1.035$   
 Nearest person  
 Nearest thousands

$(4w - 1)(w + 3)$   
 $(w - 3)(4w + 1)$   
 Always tricky in factoring

Can put equation into rule & change  $\Delta T$  to .50  

X	Y	$\Delta T$
-1.5	15.25	0.50
0.5	7.25	0.50
1.25	10.75	0.50
2.5	23.25	0.50

plug each  $x$  into equation to solve which one does NOT equal the #  
 $y = 3x^2 - x + 7$   
 $y = 3(1.25)^2 - 1.25 + 7$   
 $y = 3(1.5625) - 1.25 + 7$   
 $y = 4.6875 - 1.25 + 7$   
 $y = 10.9375 \neq x$

20 A grocery store sells packages of beef. The function  $C(w)$  represents the cost, in dollars, of a package of beef weighing  $w$  pounds. The most appropriate domain for this function would be

- (1) integers  $\rightarrow$  not NEG
- (2) positive integers  $\rightarrow$  doesn't include decimals/fractions
- (3) positive rational numbers
- (4) positive integers

pounds can't be negative.  
 they can be fractions & decimals

Use this space for computations.

21 The roots of  $x^2 - 5x - 4 = 0$  are  
 (1) 1 and 4  
 (2)  $5 \pm \sqrt{41}$   
 (3) -1 and -4  
 (4)  $-5 \pm \sqrt{41}$   
 $a = b - 5$   
 $x = -b \pm \sqrt{b^2 - 4ac}$   
 $x = -(-5) \pm \sqrt{(-5)^2 - 4(1)(-4)}$   
 $x = 5 \pm \sqrt{41}$

22 The following table shows the heights, in inches, of the players on the opening-night roster of the 2015-2016 New York Knicks.

84	80	87	75	77	79	80	74	76	80	80	82	82
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The population standard deviation of these data is approximately

- (1) 3.5
- (2) 13
- (3) 79.7
- (4) 80

Be careful when plugging in #5 in.

23 A population of bacteria can be modeled by the function  $A = P(1 - r)^t$ , where  $t$  represents the time since the population first started decaying, and  $P$  represents the population of the remaining bacteria at time  $t$ . What is the rate of decay for this population?  
 $f(t) = 1000(0.98)^t$   
 (1) 98%  
 (2) 2%  
 (3) 0.98%  
 (4) 0.02%  
 $r = 1 - 0.98 = 0.02$   
 decay = 2%

24 Bamboo plants can grow 91 centimeters per day. What is the approximate growth of the plant, in inches per year?  
 (1) 1.49  
 (2) 3.79  
 (3) 9.83  
 (4) 35.83  
 $91 \text{ cm} \rightarrow \text{in}$   
 $\frac{91 \text{ cm}}{\text{day}} \rightarrow \frac{\text{in}}{\text{year}}$   
 $1 \text{ day} \rightarrow \frac{1 \text{ in}}{2.54 \text{ cm}} \rightarrow \frac{1 \text{ day}}{2.54 \text{ cm}} = \frac{91}{60.96} = 1.4927828 \text{ in/year}$

Can cross out diagonals when they are the same.  
 From the formula share

Part II

Answer all 8 questions in this part. Each correct answer will receive 2 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily drawn to scale. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil. [16]

25 Solve algebraically for  $x$ :

Distribute  $-\frac{2}{3}(x+12) + \frac{2}{3}x = -\frac{5}{4}x + 2$

Combine  $-\frac{2}{3}x + 8 + \frac{2}{3}x = -\frac{5}{4}x + 2$

$-8 = -\frac{5}{4}x + 2$

Solve  $\frac{-10 = -\frac{5}{4}x}{-2} \left( -\frac{4}{5} \right)$

$-10 = -\frac{5}{4}x \left( -\frac{4}{5} \right)$

$x = 8$

Check:  $-\frac{2}{3}(x+12) + \frac{2}{3}x = -\frac{5}{4}x + 2$

$-\frac{2}{3}(8+12) + \frac{2}{3}(8) = -\frac{5}{4}(8) + 2$

$-\frac{2}{3}(20) + \frac{16}{3} = -10 + 2$

$-\frac{40}{3} + \frac{16}{3} = -10 + 2$

$-8 = -8$

1 term = monomial  
2 terms = binomial

3 terms

26 If  $C = G - 3F$ , find the trinomial that represents  $C$  when  $F = 2x^2 + 6x - 5$  and  $G = 3x^2 + 4$ .

$C = G - 3F$

$C = (3x^2 + 4) - 3(2x^2 + 6x - 5)$

Distribute  
Combine like terms

$C = 3x^2 + 4 - 6x^2 - 18x + 15$

$C = -3x^2 - 18x + 19$

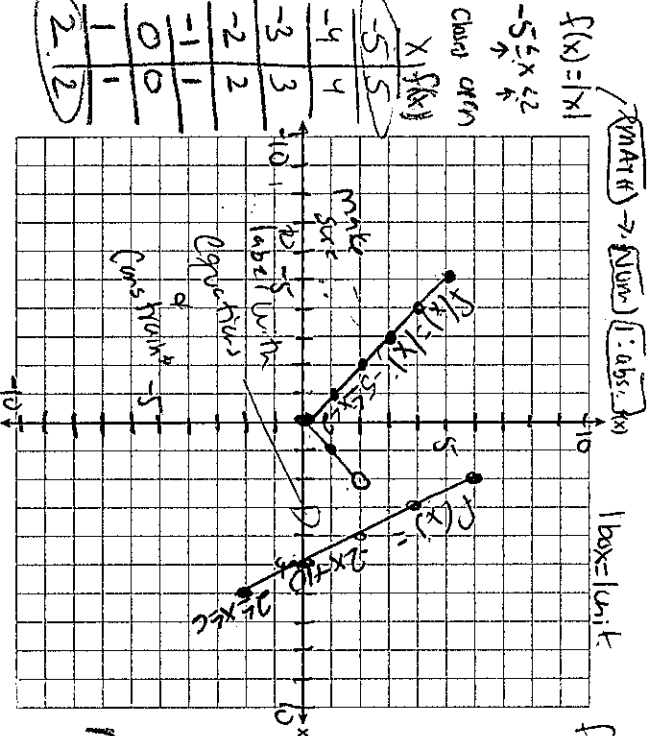
Must be in

Standard form:

DO NOT combine all like terms!

27 Graph the following piecewise function on the set of axes below:

Obs. value  $f(x) = \begin{cases} |x|, & (-5 \leq x < 9) \\ -2x + 10, & (2 \leq x \leq 9) \end{cases}$  Constant? NO! Linear? NO! Must symbol!



$f(x) = |x|$

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

closed open

$f(x) = -2x + 10$

$x$	$f(x)$
2	6
3	4
4	2
5	0
6	-2
7	-4
8	-6
9	-8

closed closed

$m = -\frac{2}{1}$   
 $B = 10$

28 Solve  $5x^2 = 180$  algebraically.

2 in Comb + 10 Quad (no linear term) NO table!

Solve alg

$$\frac{5x^2 - 180}{5} = \frac{-180}{5}$$

$$\sqrt{x^2 = 36}$$

$$x = \pm 6$$

Don't forget  $\pm$

Factor

$$5x^2 = 180$$

$$5x^2 - 180 = 0$$

$$5(x^2 - 36) = 0$$

$$5(x + 6)(x - 6) = 0$$

$x + 6 = 0$	$x - 6 = 0$
$x = -6$	$x = 6$

$\{-6, 6\}$

C.T.S

$$5x^2 = 180$$

Can't do C.T.S

B/c there is

NO linear term

"b-term"

Check #1

Check #2

$$5x^2 = 180$$

$$5(6) = 180$$

$$5(36) = 180$$

$$5x^2 = 180$$

$$5(-6)^2 = 180$$

$$5(36) = 180$$

$$180 = 180$$

$$180 = 180$$

$$\{-6, 6\}$$

29 A blizzard occurred on the East Coast during January, 2016. Snowfall totals from the storm were recorded for Washington, D.C. and are shown in the table below.

Washington, D.C.	
Time	Snow (inches)
1 a.m.	1
3 a.m.	5
6 a.m.	11
2 noon	33
3 p.m.	36

Which interval (1 a.m. to 2 noon or 6 a.m. to 3 p.m.) has the greatest rate of snowfall, in inches per hour? Justify your answer.

1 a.m. to 2 noon

$$\frac{\Delta y}{\Delta x} = \frac{33 - 1}{12 - 1} = \frac{32}{11} \text{ in/hr}$$

6 a.m. to 3 p.m.

$$\frac{\Delta y}{\Delta x} = \frac{36 - 11}{15 - 6} = \frac{25}{9} \text{ in/hr}$$

1 a.m. to 2 noon has the greater rate of change b/c  $2.90 > 2.77$

30 The formula for the volume of a cone is  $V = \frac{1}{3}\pi r^2 h$ . Solve the equation for  $h$  in terms of  $V$ ,  $r$ , and  $\pi$ .

Always get rid of fractions 1st by multiplying by the reciprocal

$$\left(\frac{3}{1}\right) V = \frac{1}{3} \pi r^2 h \left(\frac{3}{1}\right)$$

$$3V = \frac{\pi r^2 h}{3}$$

$$h = \frac{3V}{\pi r^2}$$

Answers accepted  $h = \frac{3V}{\pi r^2}$

→ have to use the previous term (term  $15^{th}$ )  
 $a_{n-1}$  is the previous term

31 Given the recursive formula:

$a_1 = 3$   
 $a_n = 2(a_{n-1} + 1)$   
 recursive

State the values of  $a_2$ ,  $a_3$ , and  $a_4$  for the given recursive formula.

$a_2$ $n=2$ $a_2 = 2(a_{2-1} + 1)$ $a_2 = 2(a_1 + 1)$ $a_2 = 2(3 + 1)$ $a_2 = 2(4)$ $a_2 = 8$	$a_3$ $n=3$ $a_3 = 2(a_{3-1} + 1)$ $a_3 = 2(a_2 + 1)$ $a_3 = 2(8 + 1)$ $a_3 = 2(9)$ $a_3 = 18$	$a_4$ $n=4$ $a_4 = 2(a_{4-1} + 1)$ $a_4 = 2(a_3 + 1)$ $a_4 = 2(18 + 1)$ $a_4 = 2(19)$ $a_4 = 38$
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32 Determine and state the vertex of  $f(x) = x^2 - 2x - 8$  using the method of completing the square.

must do this it's easier

$b = -2$   
 $f(x) = x^2 - 2x - 8$   
 $+8$

$x^2 - 2x = f(x) + 8$  must keep the  $f(x)$   
 $x^2 - 2x + (\frac{-2}{2})^2 = (x) + 8 + (\frac{-2}{2})^2$   
 Add  $(\frac{-2}{2})^2$  to both sides  
 $x^2 - 2x + 1 = f(x) + 9$   
 $(x - 1)^2 = f(x) + 9 - 9$   
 $(x - 1)^2 = f(x)$   
 perfect sq. trinomial  
 add 1 to both sides

$f(x) = (x - 1)^2 - 9$   
 $V: (1, -9)$   
 opp. same

Can put it to the vertex  
 put original in form  
 New vertex

Adding +8 to both sides doesn't change the value  
 $f(x) = x^2 - 2x + (\frac{-2}{2})^2 - 8 - (\frac{-2}{2})^2$   
 $f(x) = x^2 - 2x + 1 - 8 - 1$   
 $f(x) = (x - 1)^2 - 9$   
 $V: (1, -9)$



Part III

Answer all 4 questions in this part. Each correct answer will receive 4 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily drawn to scale. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil. [16]

33 A school plans to have a fundraiser before basketball games selling shirts with their school logo. The school contacted two companies to find out how much it would cost to have the shirts made. Company A charges a \$50 set-up fee and \$5 per shirt. Company B charges a \$25 set-up fee and \$6 per shirt.

Write an equation for Company A that could be used to determine the total cost  $A(x)$  when  $x$  shirts are ordered. Write a second equation for Company B that could be used to determine the total cost  $B(x)$  when  $x$  shirts are ordered.

Company A:  $A(x) = 5x + 50$   
 Company B:  $B(x) = 6x + 25$

Determine and state the minimum number of shirts that must be ordered for it to be cheaper to use Company A.

Costs  
 $A(x) < B(x)$   
 $5x + 50 < 6x + 25$   
 $-5x$   
 $50 < x + 25$   
 $-25$   
 $25 < x$   
 or  
 $x > 25$

Minimum of 26 shirts must be ordered

\* 25 shirts + you can't order a part of a shirt

Algebra 1 - June '19

[17]

Can check in calc for both in  $x=25$

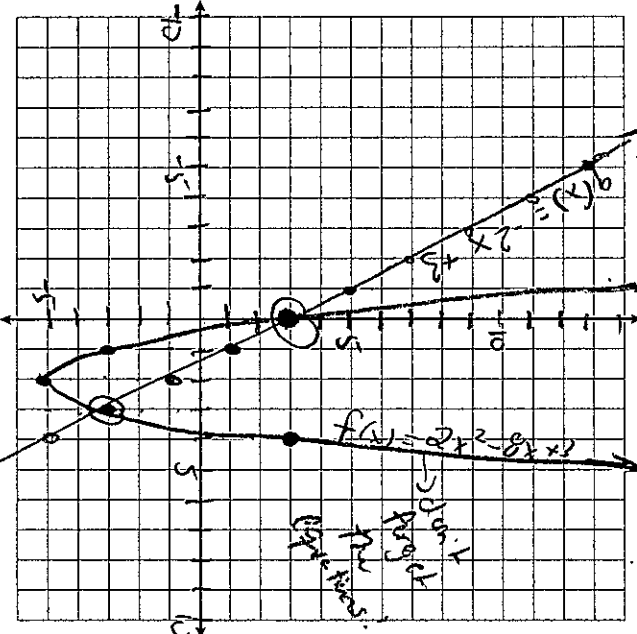
A	175	169
B	175	175

175 = 175

34 Graph  $y = f(x)$  and  $y = g(x)$  on the set of axes below.

$f(x) = 2x^2 - 8x + 3$   
 $g(x) = -2x + 3$

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



x	g(x)
-5	13
-4	11
-3	9
-2	7
-1	5
0	3
1	1
2	-1
3	-3
4	-5

Determine and state all values of  $x$  for which  $f(x) = g(x)$ .

Say only  $x = 0$  or  $x = 3$

$x = 0$  or  $x = 3$   
 $\{0, 3\}$

Algebra 1 - June '19

[18]

Can check a calc. Plug both in  $y=3$  to get  $x=0$  or  $x=3$

x	f(x)	g(x)
0	3	3
3	-3	-3

Dr Correll uses plug-in for the #5 A

35 The table below shows the number of hours ten students spent studying for a test and their scores.

Hours Spent Studying (x)	0	1	2	4	4	4	6	6	7	8
Test Scores (y)	35	40	46	65	67	70	82	88	82	95

Write the linear regression equation for this data set. Round all values to the nearest hundredth.

STAT CALC Y: StatEq

$$y = 7.79x + 34.27$$

State the correlation coefficient of this line, to the nearest hundredth.

$$r = 0.98$$

to turn on "I" unit  
y-axis to start disappears  
turn it on

Explain what the correlation coefficient suggests in the context of the problem.

The correlation coefficient shows a strong positive linear relationship

As the correlation coeff. is close to +1

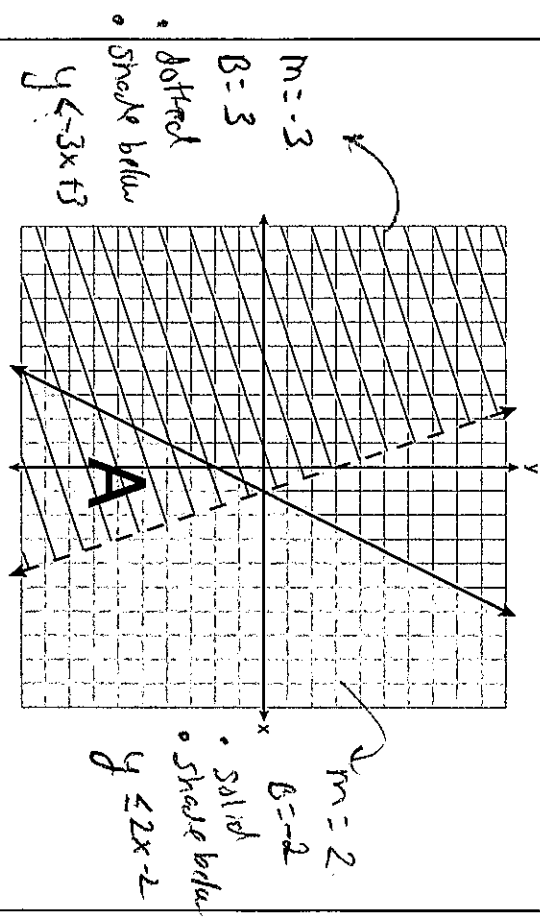
It shows as the hours spent studying increase the test scores also increase

OR the correlation coefficient shows a strong positive linear relationship between the # of hours spent studying & the student's test scores

the correlation coefficient is close to +1

correlation coefficient is close to +1

36 A system of inequalities is graphed on the set of axes below.



State the system of inequalities represented by the graph.

$$y < -3x + 3$$

$$y \leq 2x - 2$$

State what region A represents.

Region A represents the solution set for the system of inequalities

State what the gray region represents.

The gray region represents the solution set for  $y \leq 2x - 2$  only.

Part IV

Answer the question in this part. A correct answer will receive 6 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. Utilize the information provided to determine your answer. Note that diagrams are not necessarily drawn to scale. A correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil. [6]

37 When visiting friends in a state that has no sales tax, two families went to a fast-food restaurant for lunch. The Browns bought 4 cheeseburgers and 3 medium fries for \$16.53. The Greens bought 5 cheeseburgers and 4 medium fries for \$21.11.

Using a system of equations that models this situation, write a system of equations for the cost of medium fries, and for the cost of medium fries.

Browns  $4c + 3f = 16.53$  *AMUST USE c or f*  
 Greens  $5c + 4f = 21.11$

The Greens said that since their bill was \$21.11, each cheeseburger must cost \$2.49 and each order of medium fries must cost \$2.87 each. Are they correct? Justify your answer.

*NO they are not correct b/c the cost is \$23.93 not \$21.11*  
 Using your equations, algebraically determine both the cost of one cheeseburger and the cost of one order of medium fries.

$5(4c + 3f = 16.53) \rightarrow 20c + 15f = 82.65$   
 $-4(5c + 4f = 21.11) \rightarrow -20c - 16f = -84.44$   
 $-1f = -1.79$   
 $f = 1.79$

*Cost should never be a negative #*

$4c + 3f = 16.53$   
 $4c + 3(1.79) = 16.53$   
 $4c + 5.37 = 16.53$   
 $4c = 11.16$   
 $c = 2.79$

The cost of 1 cheeseburger is \$2.79 & the cost of 1 med. fries is \$1.79

check #1

$4c + 3f = 16.53$   
 $4(2.79) + 3(1.79) = 16.53$   
 $11.16 + 5.37 = 16.53$   
 $16.53 = 16.53$

check #2

$5c + 4f = 21.11$   
 $5(2.79) + 4(1.79) = 21.11$   
 $13.95 + 7.16 = 21.11$   
 $21.11 = 21.11$