

Use the information provided to answer Part A and Part B for question 2.

Let a represent a non-zero rational number and let b represent an irrational number.

2. Part A

Which expression could represent a rational number?

- A. $-b$
- B. $a + b$
- C. ab
- D. b^2

**Skip.*

Part B

Consider a quadratic equation with integer coefficients and two distinct zeros. If one zero is irrational, which statement is true about the other zero?

- A. The other zero must be rational.
- B. The other zero must be irrational.
- C. The other zero can be either rational or irrational.
- D. The other zero must be non-real.

5. Which points are on the graph of the equation $-3x + 6y + 5 = -7$?

Select **all** that apply.

A. $(-3, 6)$

B. $(-2, 0)$

C. $(0, -2)$

D. $(6, -3)$

E. $(8, 2)$

EASY POINTS!

*→ plug into equation.
if fits true then
it's on the line.*

8. The cost to manufacture x pairs of sunglasses can be represented by a function, $C(x)$. If it costs \$398 to manufacture 4 pairs of sunglasses, which of the following is true?

Select the correct equation.

- A. $C(4) = 99.50$
- B. $C(398) = 4$
- C. $C(4) = 398$
- D. $C(99.50) = 1$

Tell me



What is function notation?

label below.



$$f(x) = \underline{\hspace{2cm}}$$

↑
↑
↑

We've done this problem 10 million times THIS should be very easy. DO NOT PICK A. its easier than you think.

Part B

look back at #9

Based on the graph of the function, which statements are true?

Select **all** that apply.

→ is true y values...
is the graph above
or
below
the x axis?

- A. $f(x) < 0$ on the interval $x < 0$.
y is less (below)
- B. $f(x) > 0$ on the interval $x < 0$.
y is greater (above).
- C. $f(x) < 0$ on the interval $0 < x < 2$.
- D. $f(x) > 0$ on the interval $0 < x < 2$.
- E. $f(x) < 0$ on the interval $2 < x < 4$.
- F. $f(x) > 0$ on the interval $2 < x < 4$.
- G. $f(x) < 0$ on the interval $x > 4$.
- H. $f(x) > 0$ on the interval $x > 4$.





Unit 1 - Section 2 (Calculator)

Once you have received your calculator, continue into the calculator section.

This next section - still part of Day 1 and Unit 1
you can use a calculator.
So USE IT.



I don't know why there is a random page but I'll take this time to tell you to read my notes ~~look for~~ where I want you to write down stuff. And of course highlight!

GO ON TO NEXT PAGE

WORK for #11.

$$5x + 8y = 120$$

$$x + y = 20$$

* what does x represent?
y?

I made equations from the problem. Now I need to pick a graph that matches.
get y by itself and find the intercepts.

$$\begin{array}{r} 5x + 8y = 120 \\ -5x \quad -5x \end{array}$$

$$\frac{8y}{8} = \frac{-5x + 120}{8}$$

$$y = -\frac{5}{8}x + 15 \quad \leftarrow y \text{ intercept.}$$

$$\begin{array}{r} x + y = 20 \\ -x \quad -x \end{array}$$

$$y = 20 - x$$

↑
y intercept.

GO ON ►

that now eliminates 2 answers



Part B

Which pairs (x, y) represent hours that Leah could work to meet the given conditions?

Select **all** that apply.

In shaded area or no? Plug in equation, does it work (is it true) or no?

- A. $(4, 15)$
- B. $(5, 12)$
- C. $(10, 9)$
- D. $(15, 5)$
- E. $(19, 1)$

Part C

If Leah babysits for 7 hours this month, what is the minimum number of hours she would have to work at the ice cream shop to earn at least \$120?

Give your answer to the nearest whole hour.

Enter your answer in the box.

*plug in 7 into equation. then solve for y.
 $5x + 8y = 120$.*

Part D

Leah prefers babysitting over working at the ice cream shop. Out of 20 total hours, what is the maximum number of hours she can babysit to be able to earn at least \$120 per month?

Give your answer to the nearest whole hour.

Enter your answer in the box.

look back at the graph and pick max or min points to test.



Use the information provided to answer Part A through Part C for question 13.

Phil and Matt made cookies for a fundraiser at their high school.

- Phil made 25% more cookies than Matt.
- The cookies sold for \$0.25 each.
- After the sale, 20% of the combined total of their cookies remained.

★ Skip.
Seems for
the
answer
if you
want to
check
yourself!

13. Part A

Create an equation to represent the total amount of money Matt and Phil earned at the fundraiser based on the number of cookies Matt made. Explain how you determined your equation.

Enter your equation and your explanation in the space provided.

Part B

Phil and Matt made a total of \$72.00 selling the cookies. How many cookies did Phil make and how many cookies did Matt make? Show your work.

Enter your answers and your work in the space provided.

Part C

Next year Phil and Matt may sell the cookies for \$.50 each. They plan to make the same total number of cookies, but they predict that they will only sell 70% of them given the price increase. Based on their prediction, should Phil and Matt raise the price of the cookies? Justify your answer.

Enter your answer and your justification in the space provided.



10) C, E 1pt.

11) A: D 4pts.

B: A, B, C

C: 11

D: 13.

12) -3 1pt.

13) See
me for
answer 6pts.

14) No it
won't
work! 3pts



You have come to the end of the calculator section in Unit 1 of the test.

- Review your answers in the calculator section of Unit 1 only.
- Then, close your test booklet and answer document and raise your hand to turn in your test materials.





Directions for Completing the Answer Grids

1. Work the problem and find an answer.
2. Write your answer in the boxes at the top of the grid.
3. Print only one number or symbol in each box. Do not leave a blank box in the middle of an answer.
4. Under each box, fill in the circle that matches the number or symbol you wrote above. Make a solid mark that completely fills the circle.
5. Do not fill in a circle under an unused box.
6. Fractions cannot be entered into an answer grid and will not be scored. Enter fractions as decimals.
7. See below for examples on how to correctly complete an answer grid.

EXAMPLES

To answer -3 in a question, fill in the answer grid as shown below.

-	3				
●					
○	○	○	○	○	○
○	0	0	0	0	0
○	1	1	1	1	1
○	2	2	2	2	2
●	3	3	3	3	3
○	4	4	4	4	4
○	5	5	5	5	5
○	6	6	6	6	6
○	7	7	7	7	7
○	8	8	8	8	8
○	9	9	9	9	9

To answer $.75$ in a question, fill in the answer grid as shown below.

.	7	5			
○					
○	○	○	○	○	○
○	0	0	0	0	0
○	1	1	1	1	1
○	2	2	2	2	2
○	3	3	3	3	3
○	4	4	4	4	4
○	5	●	5	5	5
○	6	6	6	6	6
○	7	●	7	7	7
○	8	8	8	8	8
○	9	9	9	9	9



So easy. easy point.

23. Jerome is constructing a table of values that satisfies the definition of a function.

Input	-13	20	0	-4	11	-1	17	
Output	-15	-11	-9	-2	-1	5	5	13

Which number(s) can be placed in the empty cell so that the table of values satisfies the definition of a function?

Select **all** that apply.

- A. -5
- B. -1
- C. 0
- D. 2
- E. 11
- F. 17

** What cannot repeat in order for something to be a function?*



21.

We've done this!

Elephant Population Estimates—Namibia

Combined estimates for Etosha National Park and the Northwestern Population

Year	Base Year	Estimated Number of Elephants
1998	3	3,218
2000	5	3,628
2002	7	3,721
2004	9	3,571

The elephant population in northwestern Namibia and Etosha National Park can be predicted by the expression $2,649(1.045)^b$, where b is the number of years since 1995.

What does the value 2,649 represent?

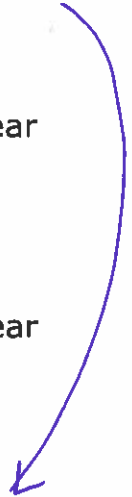
- A. the predicted increase in the number of elephants in the region each year
- B. the predicted number of elephants in the region in 1995
- C. the year when the elephant population is predicted to stop increasing
- D. the percentage the elephant population is predicted to increase each year

know this!

$Y = a \cdot b^x$

*↑
y int
(starting point!)*

*↑
multiplier!
(how it's increasing
growth or decay)*



Unit 2



17. Let $|x| + |y| = c$ where, c is a real number.

** skip.*

Determine the number of points that would be on the graph of the equation for **each** given case:

Case 1: $c < 0$ *not possible.*

Case 2: $c = 0$ *only if x and y are 0*

Case 3: $c > 0$ *infinite solutions.*

this is a logic question.

Justify your answers.

Enter your answers and justifications in the space provided.

literal equations.

18. The formula for finding the perimeter, P , of a rectangle with length l and width w is given.

$$P = 2l + 2w$$

Which formula shows how the length of a rectangle can be determined from the perimeter and the width?

A. $l = \frac{P}{2} - 2w$

B. $l = \frac{P-2w}{2}$

C. $l = \frac{P}{2} + w$

D. $l = \frac{P-2}{2w}$

get "l" by itself.

*subtract $2w$
divide by 2.*



Use the information provided to answer Part A and Part B for question 24.

Rachel manages a souvenir store. A popular item at the store is a small drum. The store typically sells 1,000 of these drums per month for \$10 each. Rachel knows that for each \$1 increase in the price of the drum, 20 fewer drums would be sold in a month.

24. Part A

What is a function for the monthly revenue, in dollars, from sales of the drum, $R(x)$, where x represents the number of price increases of \$1? Monthly revenue equals the number of drums sold times the price of each drum.

- A. $R(x) = (1,000 - x)(10 + 20x)$
- B. $R(x) = (1,000 + 20x)(10 - x)$
- C. $R(x) = (1,000 + x)(10 - 20x)$
- D. $R(x) = (1,000 - 20x)(10 + x)$

(number of drums) (price of drum.)
 $1000 - 20x$ $\$10 + \text{increase}$

Part B

Which statements are true about R , the monthly revenue from sales of the small drum?

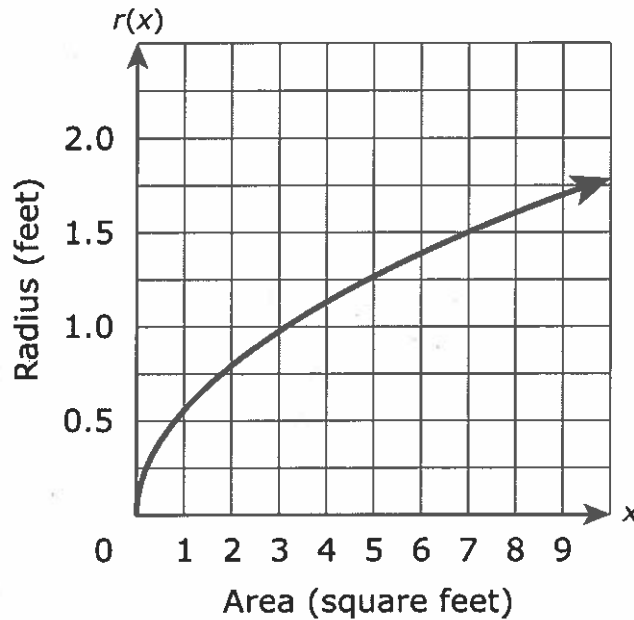
Skip.

Select **all** that apply.

- A. To maximize revenue, the drum should be sold for \$20.
- B. To maximize revenue, the drum should be sold for \$30.
- C. To maximize revenue, the drum should have a price increase of \$20.
- D. The revenue is the same for a price increase of \$10 and a price increase of \$30.
- E. The amount of revenue from the sales of the drum is 60% greater with a price increase of \$5.
- F. The maximum revenue is \$8,000 more than the revenue from selling the drum with no price increase.



26. The function $r(x)$ represents the radius of a circle for a given area, x . A graph of the function is shown in the figure.



According to the graph, what is the approximate average rate of change in the radius of the circle as the area increases from 3 square feet to 7 square feet?

- A. 0.125 foot per square foot
- B. 0.25 foot per square foot
- C. 0.5 foot per square foot
- D. 8 feet per square foot

We done this!
 * Fill out this chart

x	x
3	
7	

use calculator to find rate of change

OR use $\frac{y_2 - y_1}{x_2 - x_1}$ for the points above



28. In the equations listed, a , b , c , and d are real numbers. Which of the equations could have solutions that are non-real?

Select **all** that apply.

A. $ax^2 = b$

B. $ax^2 + bx = 0$

C. $ax^2 + bx + c = 0$

D. $(ax + b)(cx + d) = 0$

E. $a(bx + c)^2 = d$

skip.



15) A, C, D.

16) 3

17) see me

18) B

19) C

20) A: D
B: A, C

21) B

22) A: see to check
B: me

23) A, D

24) A: D
B: B, L, D, F

25) D

26) A

27) A: A, C, P
B: see me to
C: check



You have come to the end of Unit 2 of the test.

- Review your answers from Unit 2 only.
- Then, close your test booklet and answer document and raise your hand to turn in your test materials.

28) A, C, E

29) B

30) A: A
B: C





Unit 3 (Calculator)

Directions:

Today, you will take Unit 3 of the Algebra I Practice Test. You will be able to use a calculator.

Read each question. Then, follow the directions to answer each question. Mark your answers by completely filling in the circles in your answer document. Do not make any pencil marks outside of the circles. If you need to change an answer, be sure to erase your first answer completely. If a question asks you to show or explain your work, you must do so to receive full credit. Only responses written within the provided space will be scored.

If you do not know the answer to a question, you may go on to the next question. If you finish early, you may review your answers and any questions you did not answer in this unit ONLY. Do not go past the stop sign.

*We did most
of these
questions
but it's a good
review.
Read through
this!*



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7. See below for examples on how to correctly complete an answer grid.

EXAMPLES

To answer -3 in a question, fill in the answer grid as shown below.

-	3				
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

To answer $.75$ in a question, fill in the answer grid as shown below.

.	7	5			
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<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

in scores



Use the information provided to answer Part A and Part B for question 32.

The area, A , in square feet, of a rectangular storage bin in a warehouse is given by the function $A(x) = -2x^2 + 36x$, where x is the width, in feet, of the storage bin.

32. Part A

Y= graph zoom out 2nd trace to find zeros

If the function is graphed in a coordinate plane, which statement would be true?

- A. The x -intercepts of the function are 0 and 8, which are a lower bound and an upper bound for the possible values of the length of the storage bin.
- B. The x -intercepts of the function are 0 and 8, which are a lower bound and an upper bound for the possible values of the width of the storage bin.
- C. The x -intercepts of the function are 0 and 18, which are a lower bound and an upper bound for the possible values of the length of the storage bin.
- D. The x -intercepts of the function are 0 and 18, which are a lower bound and an upper bound for the possible values of the width of the storage bin.

Part B

The process of completing the square can be used to calculate the width, in feet, of the storage bin that gives a maximum area. What is the missing value?

$$A = -2x^2 + 36x$$

$$A = -2(x - 9)^2 + ?$$

← The y value of the vertex!

Enter your answer in the box.



2nd trace to find minimum



Skip.

34. Consider the following claim: If the point $(2 + d, y)$ is on the graph of the function $f(x) = x(x - 4)$, then the point $(2 - d, y)$ is also on the graph.

- Use algebra to show that the claim is true.
- What is the relationship between the line $x = 2$ and the graph of $f(x)$? Justify your reasoning.

Enter your work, your answer, and your justification in the space provided.

35. At the beginning of an experiment, the number of bacteria in a colony was counted at time $t = 0$. The number of bacteria in the colony t minutes after the initial count is modeled by the function $b(t) = 4(2)^t$. Which value and unit represent the average rate of change in the number of bacteria for the first 5 minutes of the experiment?

Select **all** that apply.

- A. 24.0
- B. 24.8
- C. 25.4
- D. 25.6
- E. bacteria
- F. minutes
- G. bacteria per minute
- H. minutes per bacteria

x	y
0	
5	



plug values into equation then once you get y values use

$$\frac{y_2 - y_1}{x_2 - x_1}$$





37. A ball was thrown upward into the air. The height, in feet, of the ball above the ground t seconds after being thrown can be determined by the expression $-16t^2 + 40t + 3$. What is the meaning of the 3 in the expression?
- A. The ball took 3 seconds to reach its maximum height.
 - B. The ball took 3 seconds to reach the ground.
 - C. The ball was thrown from a height of 3 feet.
 - D. The ball reached a maximum height of 3 feet.

this is always the y intercept.



39. If a is a non-zero, real number and $a(x - 3)^2 - b = c$,

• Prove that $x = 3 \pm \sqrt{\frac{b+c}{a}}$. Show your work. *skip*

• If $a = 2$ and $b = 5$, determine what condition(s) on c will restrict the solutions for x to real numbers.

Explain your reasoning.

Enter your proof, your answer, and your explanation in the space provided.



Part D

Another town's population could be modeled by the function

$P(t) = 27,400(1.66)^{\frac{t}{10}}$, where P represents the population and t represents the time, in years, since 2005. Based on the model, by approximately what percent does the population of this town increase each year?

- A. 1
- B. 3
- C. 5
- D. 7

What do you know about
 $y = a \cdot b^x$

41. Caroline knows the height and the required volume of a cone-shaped vase she's designing. Which formula can she use to determine the radius of the vase?

- A. $r = \sqrt{\frac{V}{3\pi h}}$
- B. $r = \sqrt{\frac{3V}{\pi h}}$
- C. $r = \frac{\sqrt{3V}}{\pi h}$
- D. $r = \pm \sqrt{\frac{3V}{\pi h}}$

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

↑
 get this from the exhibits section.

so you just move stuff around to get it.

$$\times 3$$

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

multiply by 3

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

Now divide

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

$$\sqrt{\frac{3V}{\pi h}} = r$$

Now square root

