

Tennessee Comprehensive Assessment Program

TCAP

Algebra I Practice Test Subpart 1, Subpart 2, & Subpart 3

Student Name

Teacher Name



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Test Administrator Instructions:

This practice test has Subpart 1, Subpart 2, and Subpart 3. There is also an answer document and an answer key at the end of this document. It is recommended that you print one copy of this practice test and pull the answer key before copying and distributing the practice test and answer document to your students.

This practice test is representative of the operational test but is shorter than the actual operational test. To see the details about the operational test, please see the blueprints located on the Tennessee Department of Education website.

Directions

Subpart 1 of this Practice Test booklet contains selected-response items in Algebra I. You may use this test booklet for scratch paper and to mark notes. However, you must write all of your answers on your answer document.

You MAY NOT use a calculator in Subpart 1 of this test booklet.

Sample 1: Selected-Response

- 1.** Factor the polynomial:

$$s^2 + 12s + 32$$

- A.** $(s + 4)(s - 8)$
- B.** $(s - 2)(s + 16)$
- C.** $(s + 4)(s + 8)$
- D.** $(s + 16)(s + 2)$



- 1.** Let c represent any non-zero rational number.

Select **all** values that, when added to c , will produce an irrational number.

A. $-\frac{5}{13}$

B. π^2

C. $\sqrt{36}$

D. 8.73

E. $\sqrt{95}$

- 2.** Grace and her brother Sid want to raise money to go to band camp. Their parents have agreed to help them earn up to \$400 by paying them \$25 when one of them mows the lawn and \$10 for each hour that one of them babysits their younger brother. They will have to do a combination of both chores in order to earn the money.

Select the equation that represents the number of lawns they can mow, m , and hours they can babysit, b , to earn \$400.

A. $10m + 25b = 400$

B. $10m - 25b = 400$

C. $25m + 10b = 400$

D. $25m - 10b = 400$



3. Select **all** tables that could represent a function.

A.

x	y
-4	8
-1	2
1	-3
4	9

B.

x	y
0	3
2	3
4	5
6	5

C.

x	y
1	-1
3	-4
3	-6
7	-9

D.

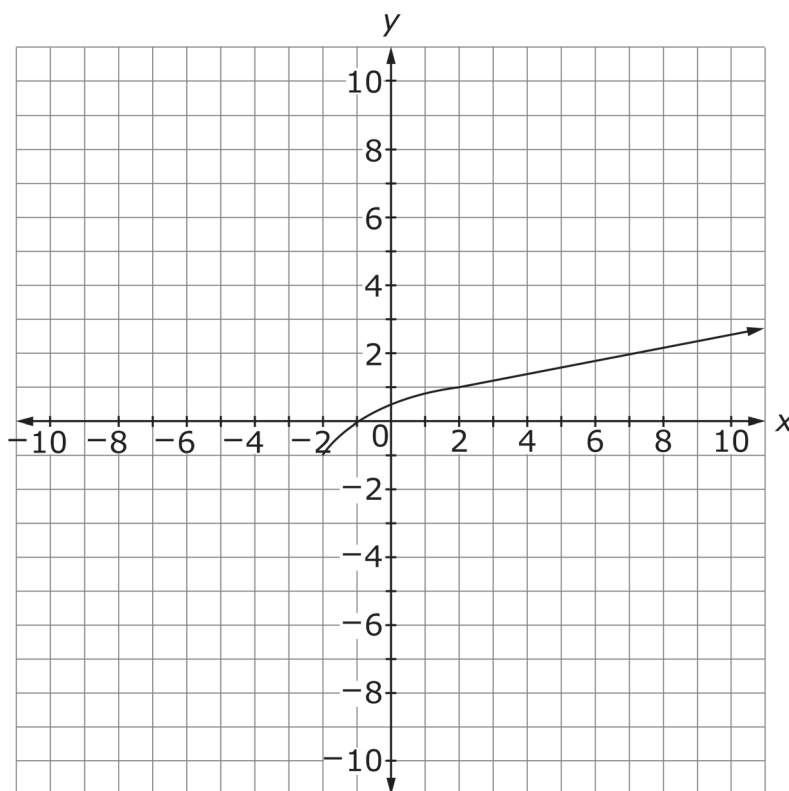
x	y
5	1
5	2
5	3
5	4

E.

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



4. Which pair **best** represents a causation relationship?
- A. a child's age and shoe size
 - B. the number of ice cream cones sold and the amount of sunscreen sold
 - C. the temperature at a football game and the number of hot drinks sold
 - D. the number of people attending a ballgame and the length of the ballgame
5. A function is graphed on the coordinate plane.



Select the function that is graphed on the coordinate plane.

- A. $f(x) + \sqrt{x+1} - 2$
- B. $f(x) + \sqrt{x-1} + 2$
- C. $f(x) + \sqrt{x+2} - 1$
- D. $f(x) + \sqrt{x-2} + 1$



6. Consider the given equation.

$$4a^2 + 5b = 9b - 7c$$

Solve the equation for b .

A. $b = \frac{-7c - 4a^2}{5}$

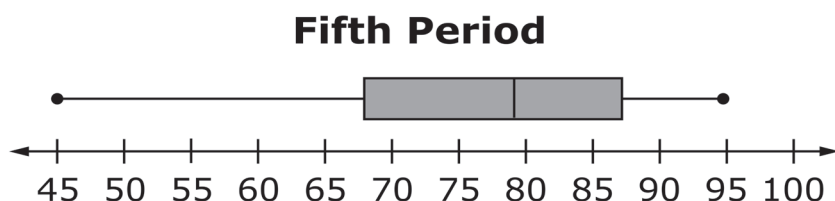
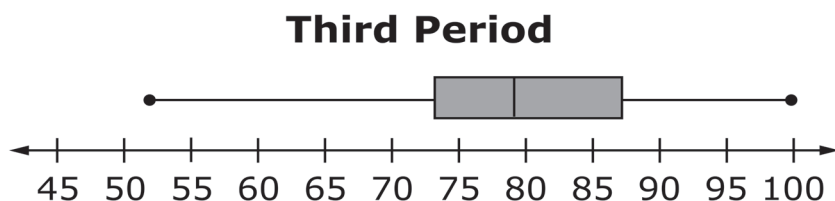
B. $b = \frac{\sqrt{4a - 7c}}{4}$

C. $b = \frac{4a^2 + 7c}{4}$

D. $b = \frac{4a^2 - 4c}{7}$



7. Two of Mr. Evan's Earth science classes have 23 students each. Box plots for recent test scores for these two classes are displayed.

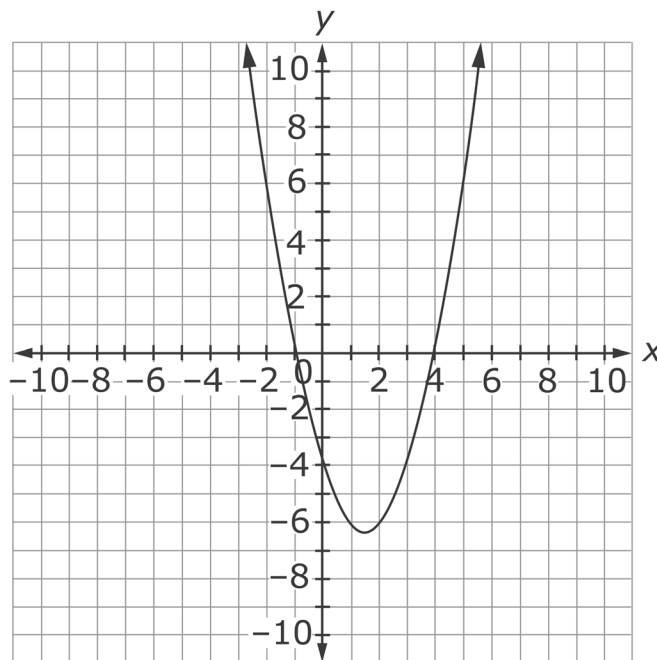


Which statement about the scores is true?

- A. The means of the two sets of data are equal.
 - B. The lower quartiles of the two sets of data are the same.
 - C. More students in third period than in fifth period scored an 87 or above.
 - D. The number of students in third period who scored from 73 to 79 equaled the number of students in fifth period who scored from 68 to 79.
8. What is the **best** first step in solving the equation $3x^2 + 8x = -5$?
- A. adding 5 to both sides
 - B. dividing both sides by 3
 - C. taking the square root of both sides
 - D. factoring an x out of the left side of the equation



9. The function $f(x) = x^2 - 3x - 4$ is graphed on the coordinate plane.



Consider $f(x - 3)$. Which option correctly describes the transformation to the graph?

- A. up 3 units
- B. down 3 units
- C. left 3 units
- D. right 3 units



**This is the end of Subpart 1 of the Algebra I Practice Test.
Proceed to Subpart 2.**

**Directions**

Subpart 2 of this Practice Test booklet contains selected-response items in Algebra I. Write all answers on your answer document.

You MAY use a calculator in Subpart 2 of this test booklet.

- 10.** The height, in inches, of each student in Megan's algebra class is shown.

72	72	71	70	70
70	69	67	66	65
65	65	64	63	62
62	62	59	58	54

Select **all** measures that will be affected if a student who is 77 inches tall joins the class.

- A.** interquartile range
 - B.** mean
 - C.** median
 - D.** range
 - E.** standard deviation
- 11.** Which expression is equivalent to $(q^2 - 16)$?
- A.** $(q - 4)^2$
 - B.** $q^2 - 4q - 16$
 - C.** $(q + 4)(q - 4)$
 - D.** $(q - 8)(q + 2)$



- 12.** Solve the inequality.

$$4x - 7 \geq \frac{-12x + 14}{4}$$

A. $x \geq 3\frac{1}{2}$

B. $x \leq 3\frac{1}{2}$

C. $x \geq 1\frac{1}{2}$

D. $x \leq 1\frac{1}{2}$

- 13.** The first term in a sequence is 8. Consecutive terms in the sequence have a common difference. The fourth term in the sequence is 17.

Select the function, $f(n)$, that represents this sequence for $n \geq 1$.

A. $f(1) = 8$
 $f(n + 1) = f(n) - 3$

B. $f(1) = 8$
 $f(n + 1) = f(n) + 3$

C. $f(1) = 8$
 $f(n + 1) = \frac{9}{4}f(n)$

D. $f(1) = 8$
 $f(n + 1) = \frac{17}{8}f(n)$



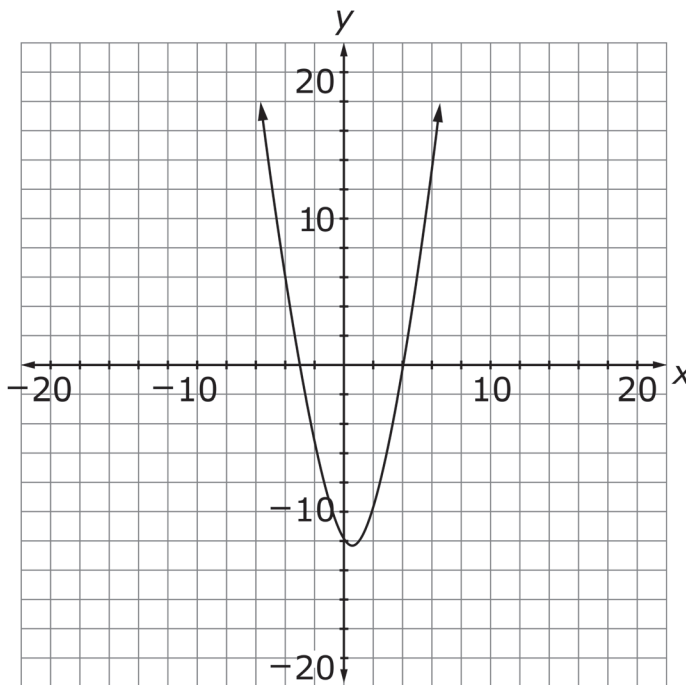
- 14.** The equation $A = 1750(1.04)^t$ represents an account balance t years after the account was created.

Which statement is correct?

- A.** The account balance will decrease 0.04% each year.
- B.** The account balance will increase 0.04% each year.
- C.** The account balance will decrease 4% each year.
- D.** The account balance will increase 4% each year.



- 15.** The graph of the function $f(x)$ and the equation of a different function, $g(x)$, are given.



$$g(x) = 2x - 2$$

Select **all** values of x for which $f(x) = g(x)$.

- A.** - 3
- B.** -2
- C.** 0
- D.** 2
- E.** 5
- F.** 8



- 16.** One end of a metal spring is attached to a ceiling. The other end of the spring hangs down.

The table displays the length of the spring when different masses are tied to the end of the spring that hangs down.

Mass Tied to Spring (kg)	Length of Spring (cm)
0	439.0
2	439.1
4	439.2
6	439.3

How much longer does the spring become with each extra kilogram of mass that is tied to it?

- A.** 0.01 cm
B. 0.05 cm
C. 0.1 cm
D. 0.5 cm
- 17.** Consider the equation $x^2 - 12x + 49 = 22$.
Which equation has the same solution(s) as the given equation?
- A.** $(x - 6)^2 = 9$
B. $(x - 7)^2 = 22$
C. $(x + 7)^2 = 4.7$
D. $(x - 12)^2 = -27$



- 18.** A rock is thrown from a cliff into a ravine.

The function $h(t) = -16t^2 + 192t + 2560$ describes the height, in feet, of the rock t seconds after it is thrown.

What is the height of the rock, in feet, 8 seconds after it is thrown?

Write your answer in the space provided on your answer document.

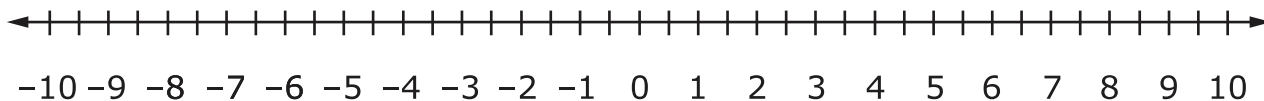
- 19.** John has a goal to ride his bike at least 100 miles this summer. John has ridden 12 miles thus far. There are 40 days left in the summer.

Write an inequality to represent the average distance, d , in miles, John must ride each day for the rest of the summer to achieve his goal.

Write your answer in the space provided on your answer document.

- 20.** Consider the function $f(x) = -2x^2 + 20x - 42$.

On the number line on your answer document, select the range of values of x for which $f(x) \geq 0$.





21. A multiplication table is shown. Mark the boxes within the table provided in your answer document for which the product of the row and column is a **rational** number.

	$-\frac{2}{3}$	$\sqrt{30}$	9.4	π
$-\frac{2}{3}$	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
$\sqrt{30}$	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9.4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
π	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

22. Simplify the expression $(3x^4 + 9x^3 - 7x + 15) + (-6x^4 - 8x^2 + 5x - 3)$.
Write your answer in the space provided on your answer document.



This is the end of Subpart 2 of the Algebra I Practice Test.
Proceed to Subpart 3.



Directions

Subpart 3 contains constructed-response items and selected-response items in Algebra I. Write all answers on your answer document.

You MAY use a calculator in Subpart 3 of this test booklet.

- 23.** Harold's car has a fuel tank with 12 gallons of fuel in it. The fuel efficiency of Harold's car is 25 miles per gallon.

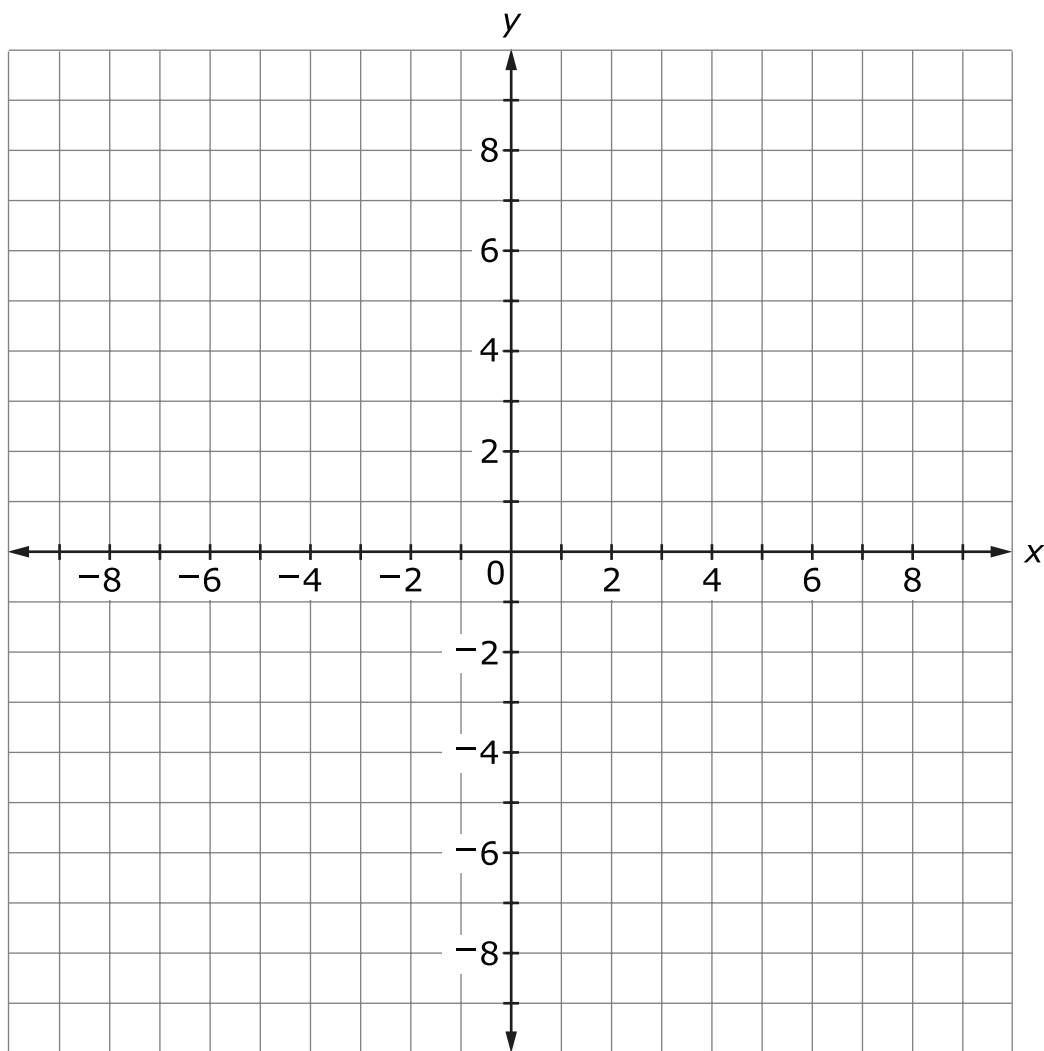
Write an equation to represent the amount of fuel remaining, f , in Harold's car after driving m miles.

Write your answer in the space provided on your answer document.



- 24.** Consider the function $f(x) = x^2 - 2x$.

Graph the function $f(x)$ on the coordinate plane provided on your answer document.



- 25.** The Booneville History Museum had 25,000 visitors in 1980. The number of visitors has decreased by 2.5% each year since 1980.

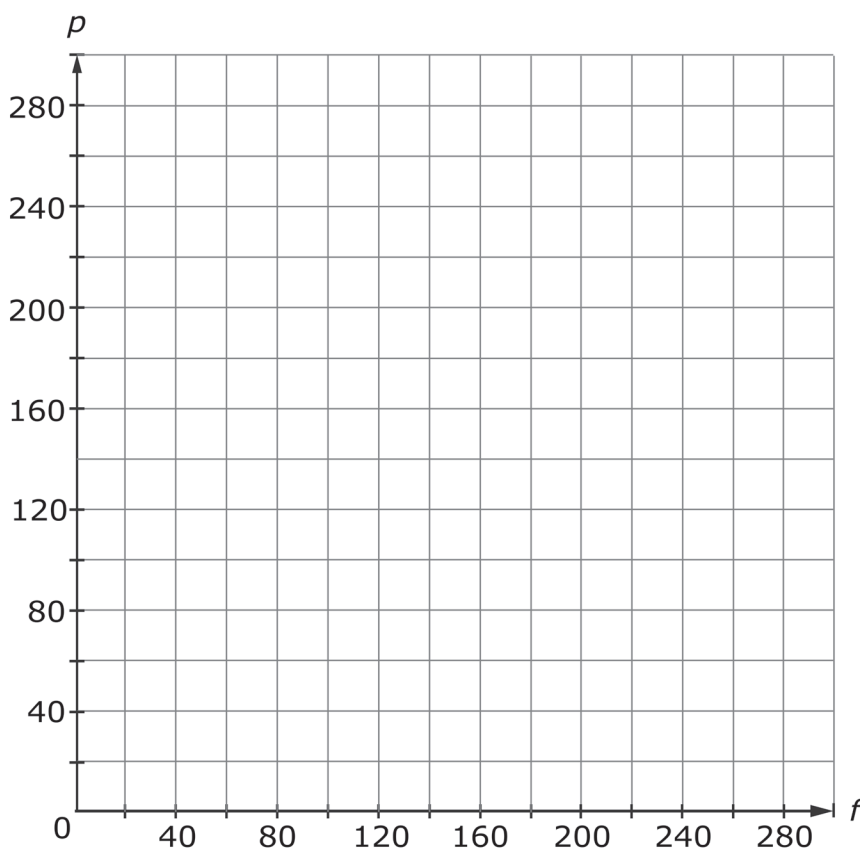
Write a function $v(t)$ to represent the number of visitors to the Booneville History Museum t years after 1980.

Write your answer in the space provided on your answer document.



- 26.** Karen is buying supplies for a party. She plans to spend at least \$100 on food and at least \$50 on party favors. She can spend no more than \$250 total on food and party favors.

Graph the solution set to the amount of money Karen can spend on food, f , and party favors, p , and spend no more than \$250 on the grid provided on your answer document.



- 27.** Consider the equation $3(x - 5)^2 + 6 = 54$.

What value(s) of x makes the equation true? Enter one solution in each space on your answer document. If there is only one solution, leave one space blank.



- 28.** Consider the functions $f(x)$, $g(x)$, and $h(x)$.

$$f(x) = -\frac{1}{25}(x + 25)(x + 50)$$

$$g(x) = -\frac{1}{2}x^2 + 4x + 24$$

$$h(x) = -10(x - 4)^2 + 25$$

Order the functions from **greatest** to **least** based on the maximum value of each function.

Write $f(x)$, $g(x)$, or $h(x)$, in each space on your answer document, in order from greatest to least.

- 29.** A quadratic function is given as $f(x) = 3x^2 + 24x + 25$.

Write the vertex form of the given function.

Write your answer in the box provided on your answer document.



- 30.** The expression $89,000(0.995)^t$ represents the population of a town t years after 1990.

On your answer document, mark the **best** choices to complete the sentence below.

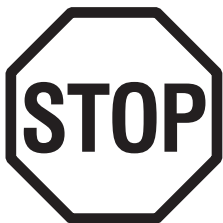
The population of the town

- ☐ increases
- ☐ decreases

by

- ☐ 0.5%
- ☐ 0.995%
- ☐ 5%
- ☐ 99.5%
- ☐ 995%

each year.



This is the end of the test.

TNReady Math Reference Sheet—High School

1 inch = 2.54 centimeters

1 meter = 39.37 inches

1 mile = 5,280 feet

1 mile = 1,760 yards

1 mile = 1.609 kilometers

1 kilometer = 0.62 mile

1 pound = 16 ounces

1 pound = 0.454 kilograms

1 kilogram = 2.2 pounds

1 ton = 2000 pounds

1 cup = 8 fluid ounces

1 pint = 2 cups

1 quart = 2 pints

1 gallon = 4 quarts

1 gallon = 3.785 liters

1 liter = 0.264 gallons

1 liter = 1000 cubic centimeters

Pythagorean Theorem: $a^2 + b^2 = c^2$

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

Arithmetic Sequence: $a_n = a_1 + (n - 1)d$

Geometric Sequence: $a_n = a_1 r^{n-1}$

Finite Geometric Series: $S_n = \frac{a_1(1 - r^n)}{1 - r}$

Degrees: 1 degree = $\frac{\pi}{180}$ radians

Radians: 1 radian = $\frac{180}{\pi}$ degrees

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Name: _____

Subpart 1 Sample Questions

1. ☐ A ☐ B ☐ C ☐ D

Subpart 1 Practice Test Questions

1. ☐ A ☐ B ☐ C ☐ D ☐ E

2. ☐ A ☐ B ☐ C ☐ D

3. ☐ A ☐ B ☐ C ☐ D ☐ E

4. ☐ A ☐ B ☐ C ☐ D

5. ☐ A ☐ B ☐ C ☐ D

6. ☐ A ☐ B ☐ C ☐ D

7. ☐ A ☐ B ☐ C ☐ D

8. ☐ A ☐ B ☐ C ☐ D

9. ☐ A ☐ B ☐ C ☐ D

Subpart 2 Practice Test Questions

10. ☐ A ☐ B ☐ C ☐ D ☐ E

11. ☐ A ☐ B ☐ C ☐ D

12. ☐ A ☐ B ☐ C ☐ D

13. ☐ A ☐ B ☐ C ☐ D

14. ☐ A ☐ B ☐ C ☐ D

15. ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F

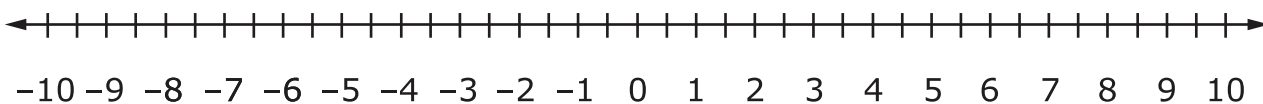
16. ☐ A ☐ B ☐ C ☐ D

17. ☐ A ☐ B ☐ C ☐ D

18.

19.

20.



21.

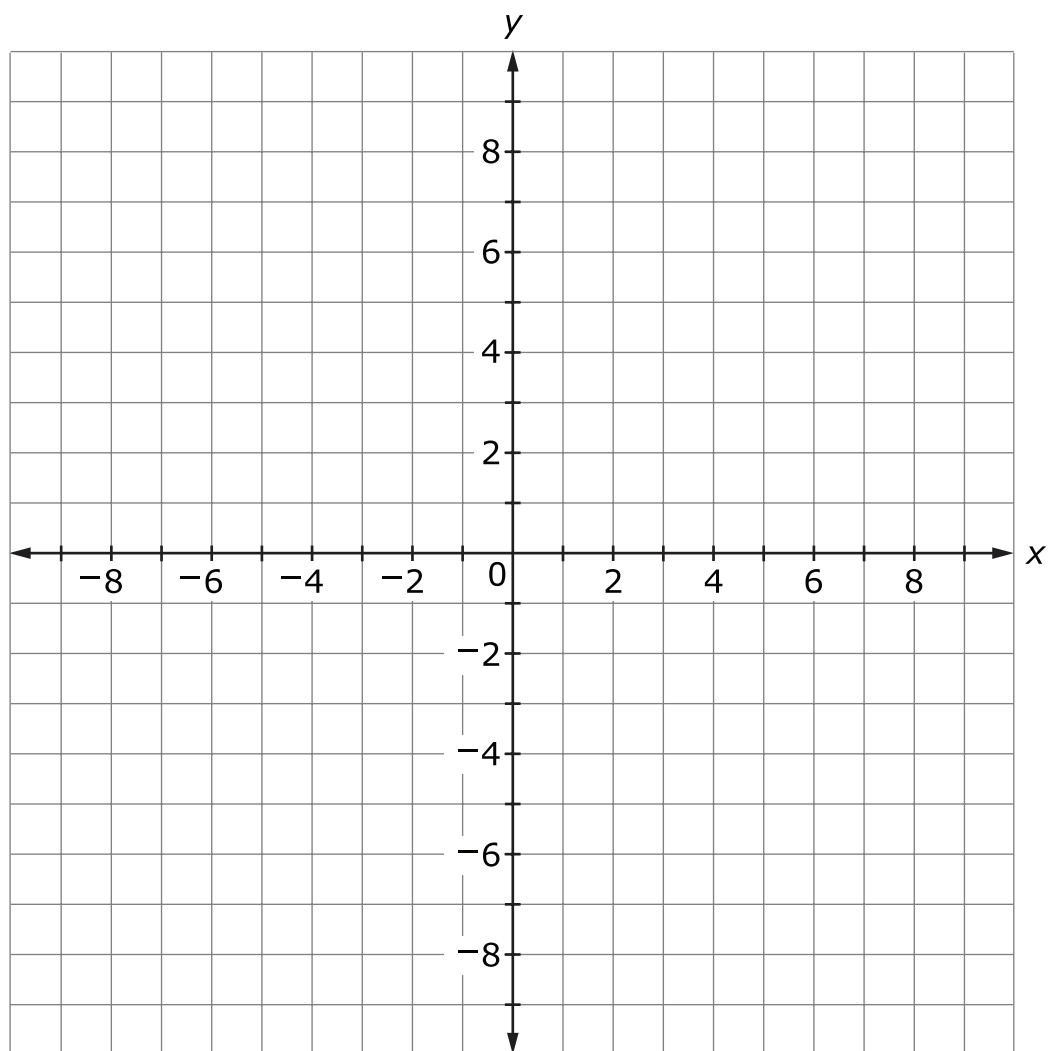
	$-\frac{2}{3}$	$\sqrt{30}$	9.4	π
$-\frac{2}{3}$	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
$\sqrt{30}$	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9.4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
π	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

22.

Subpart 3 Practice Test Questions

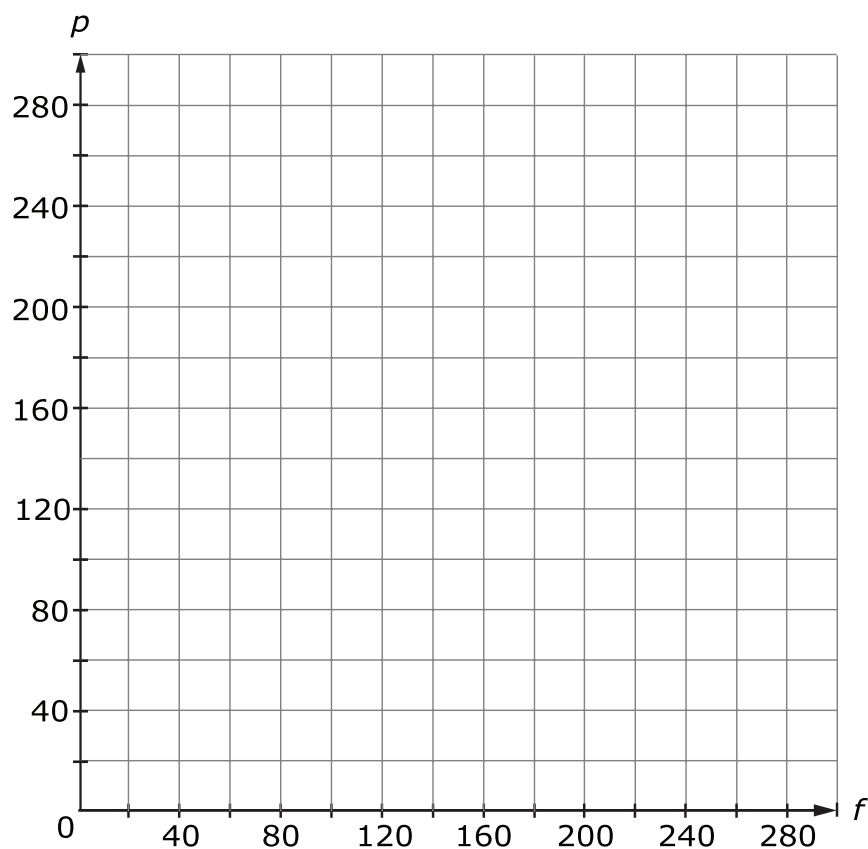
23.

24.



25.

26.



27.

28.

Greatest

Least

29.

30.

☐ increases

☐ decreases

☐ 0.5%

☐ 0.995%

☐ 5%

☐ 99.5%

☐ 995%

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Subpart 1 Sample Questions

1. ☐ A ☐ B ☒ ☐ D

Subpart 1 Practice Test Questions

1. ☐ A ☒ ☐ C ☐ D ☒

2. ☐ A ☐ B ☒ ☐ D

3. ☒ ☒ ☐ C ☐ D ☒

4. ☐ A ☐ B ☒ ☐ D

5. ☐ A ☐ B ☒ ☐ D

6. ☐ A ☐ B ☒ ☐ D

7. ☐ A ☐ B ☐ C ☒

8. ☒ ☐ B ☐ C ☐ D

9. ☐ A ☐ B ☐ C ☒

Subpart 2 Practice Test Questions

10. ☐ A ☒ ☐ C ☒ ☐ E

11. ☐ A ☐ B ☒ ☐ D

12. ☐ A ☐ B ☒ ☐ D

13. ☐ A ☒ ☐ C ☐ D

14. ☐ A ☐ B ☐ C ☒

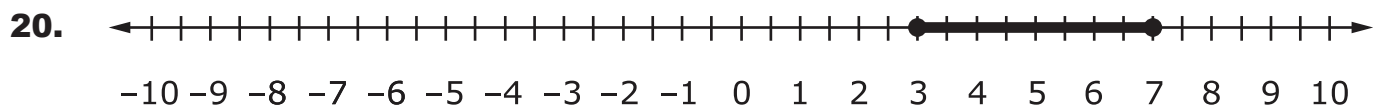
15. ☐ A ☒ ☐ C ☐ D ☒ ☐ F

16. ☐ A ☒ ☐ C ☐ D

17. ☒ ☐ B ☐ C ☐ D

18. 3072

19. $40d + 12 \geq 100$ or equivalent inequality



21.

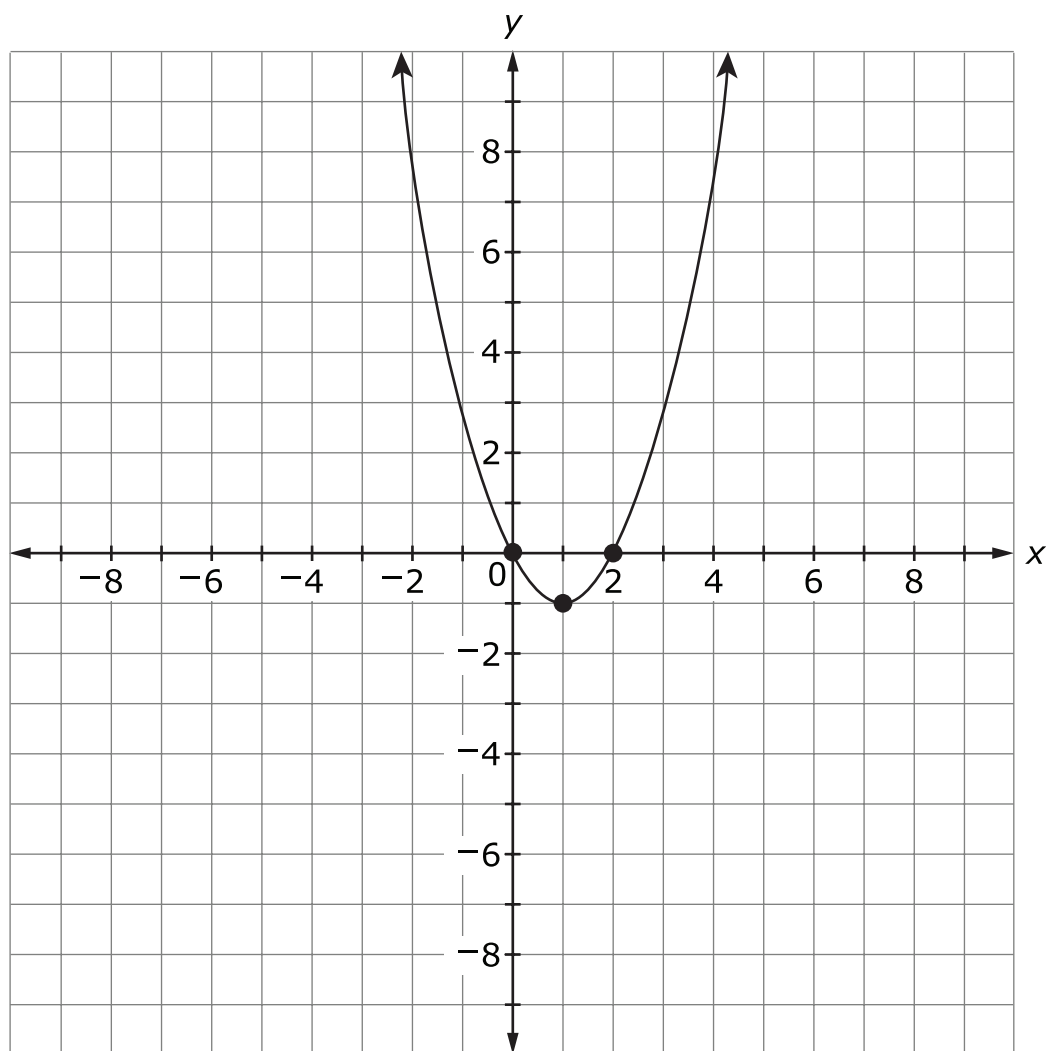
	$-\frac{2}{3}$	$\sqrt{30}$	9.4	π
$-\frac{2}{3}$	●	○	●	○
$\sqrt{30}$	○	●	○	○
9.4	●	○	●	○
π	●	●	●	●

22. $-3x^4 + 9x^3 - 8x^2 - 2x + 12$ or equivalent expression

Subpart 3 Practice Test Questions

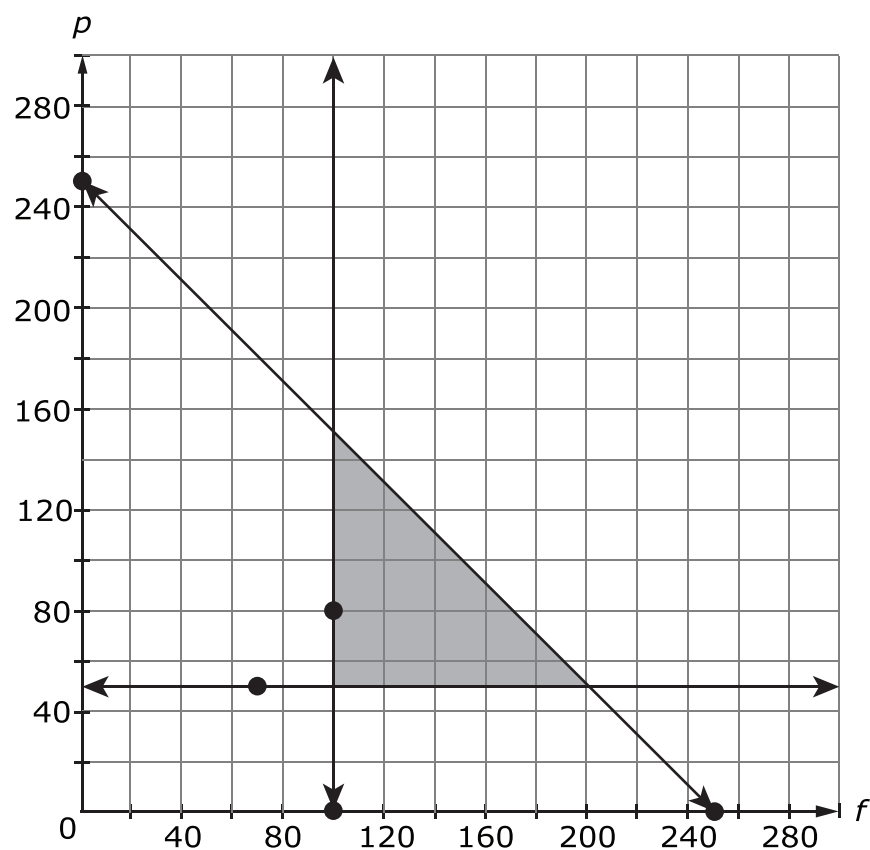
23. $f = 12 - \frac{1}{25m}$

24.



25. $(t) = 25000(0.975)^t$

26.



27. 1

9

28. Greatest $g(x)$

$h(x)$

Least $f(x)$

29. $(x) = 3(x + 4)^2 - 23$

30.☐ increases☒ decreases☒ 0.5%☐ 0.995%☐ 5%☐ 99.5%☐ 995%