

Tennessee TCAP 2020 Algebra 1 Practice

Reference Materials
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TNReady Math Reference Sheet—High School

1 inch = 2.54 centimeters
 1 mile = 5,280 feet
 1 mile = 1,760 yards
 1 mile = 1.609 kilometers
 1 kilometer = 0.62 mile
 1 meter = 39.37 inches

 1 pound = 16 ounces
 1 pound = 0.454 kilograms
 1 kilogram = 2.2 pounds
 1 ton = 2,000 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 = 1,000 cubic centimeters

Exponential Growth: $y = a(1 + r)^t$

Exponential Decay: $y = a(1 - r)^t$

Compound Interest: $A = P\left(1 + \frac{r}{n}\right)^{nt}$

Continually Compounding Interest:
 $A = Pe^{rt}$

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

Tennessee Comprehensive Assessment Program TCAP

Algebra I Practice Test



Please PRINT all information in the box.

Student Name: _____

Teacher Name: _____

School: _____

District: _____

All practice test items represent the appropriate grade level/content standards—however, the practice test may contain item types that no longer appear on the operational assessment.

Directions

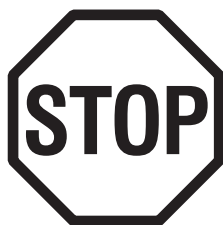
This test has Subpart 1, Subpart 2, and Subpart 3. Each subpart contains various types of assessment questions.

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

Sample: Multiple choice (one correct response)

Which binomial is a factor of the expression $2a^2 - 10a - 48$?

- A.** $a + 3$
- B.** $a + 8$
- C.** $2a + 3$
- D.** $2a - 8$



Do not go on to the next page until told to do so.



- 1** Avery is solving the following equation.

$$-2|m - 2| = -6$$

Which equation is equivalent to Avery's equation?

- A.** $-2m + 4 = -6$
- B.** $|m - 2| = -3$
- C.** $2m + 4 = 6$
- D.** $|m - 2| = 3$

- 2** Grace and her brother need \$400 to go to band camp. Their parents have agreed to help them earn money by paying them \$25 each time they mow the lawn and \$10 for each hour they babysit their younger brother. They will have to do a combination of both chores 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.

- M.** $10m + 25b = 400$
- P.** $10m - 25b = 400$
- R.** $25m + 10b = 400$
- S.** $25m - 10b = 400$



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

A.

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

D.

x	y
5	1
5	2
5	3
5	4

B.

x	y
0	3
2	3
4	5
6	5

E.

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

C.

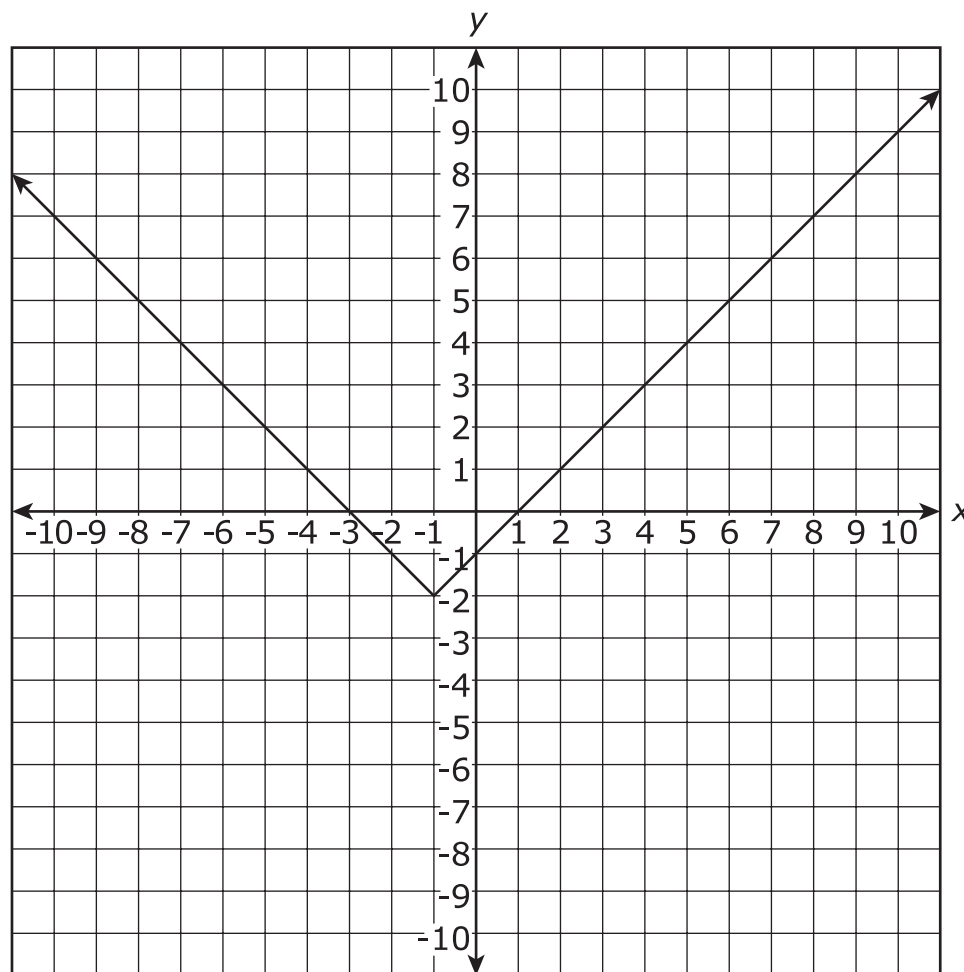
x	y
1	-1
3	-4
3	-6
7	-9



- 4 Which pair **best** represents a causation relationship?
- M.** a person's age and his/her shoe size
 - P.** the number of ice cream cones sold and the amount of sunscreen sold
 - R.** the temperature at a football game and the number of hot drinks sold
 - S.** the number of people attending a ballgame and the length of the ballgame



- 5 A function is graphed on the coordinate plane.



Which equation represents the graphed function?

- A. $f(x) = |x + 2| - 1$
- B. $f(x) = |x + 1| - 2$
- C. $f(x) = |x - 2| + 1$
- D. $f(x) = |x - 1| + 2$

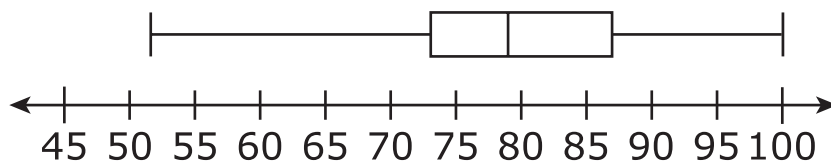


6 Which expression is equivalent to $(q^2 - 16)$?

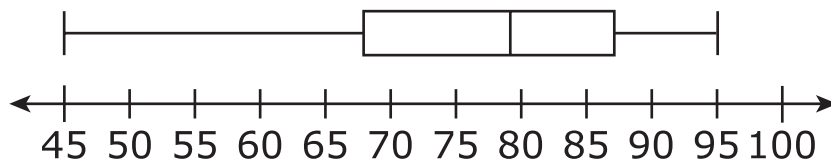
- M. $(q - 4)^2$
- P. $(q + 4)(q - 4)$
- R. $(q + 8)(q - 2)$
- S. $(q - 8)(q + 2)$

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

Third Period



Fifth Period



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. Fewer students in third period than in fifth period scored a 70 or below.



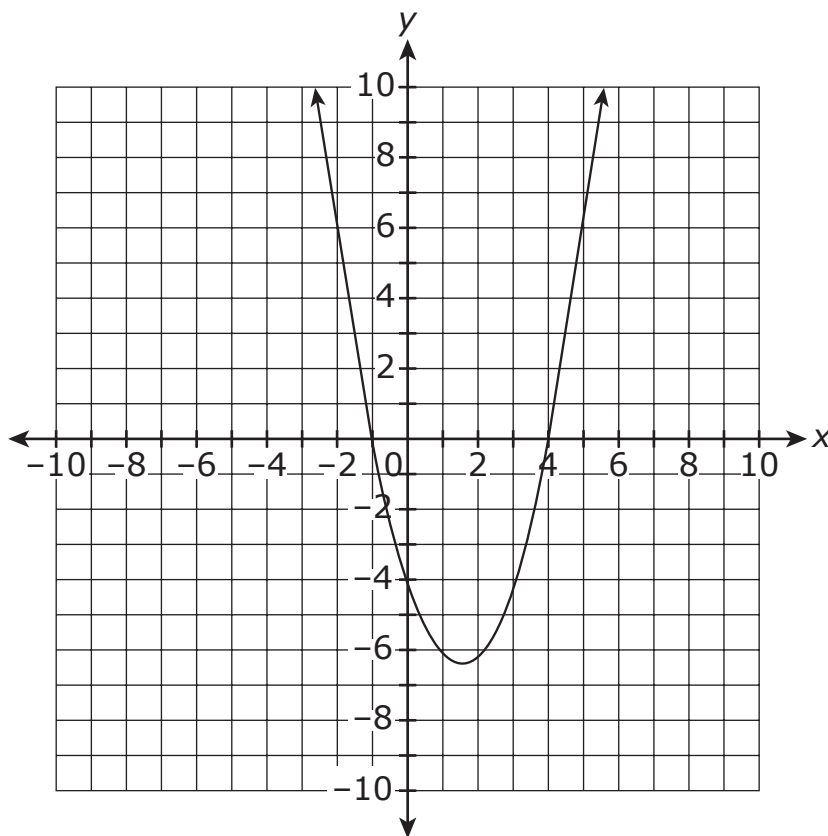
- 8 Simplify the expression.

$$(3x^4 + 9x^3 - 7x + 15) + (-6x^4 - 8x^2 + 5x - 3)$$

Enter your answer in the space provided.



- 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?

- M.** up 3 units
- P.** down 3 units
- R.** left 3 units
- S.** right 3 units



**This is the end of Subpart 1 of the Algebra I Test.
Do not go on to the next page until told to do so.**



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

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

Select the **three** 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** Jesse sent an email to 4 people for a school project. In her email, she requested that each person copy and send the same email to 4 additional people.

If everyone continues to send the email as requested, which equation could be used to determine the number of emails, y , that will be sent for a given round, x ?

- M.** $y = x^4$
- P.** $y = 4^x$
- R.** $y = 4x$
- S.** $y = \frac{4}{x}$



- 12** Solve the inequality.

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

A. $x \geq \frac{7}{2}$

B. $x \leq \frac{7}{2}$

C. $x \geq \frac{3}{2}$

D. $x \leq \frac{3}{2}$

- 13** Consider the expression $(x^2 - 4)(x + 3)$.

Select **all** values of x for which $(x^2 - 4)(x + 3) = 0$.

M. -4

P. -3

R. -2

S. 2

T. 3

V. 4



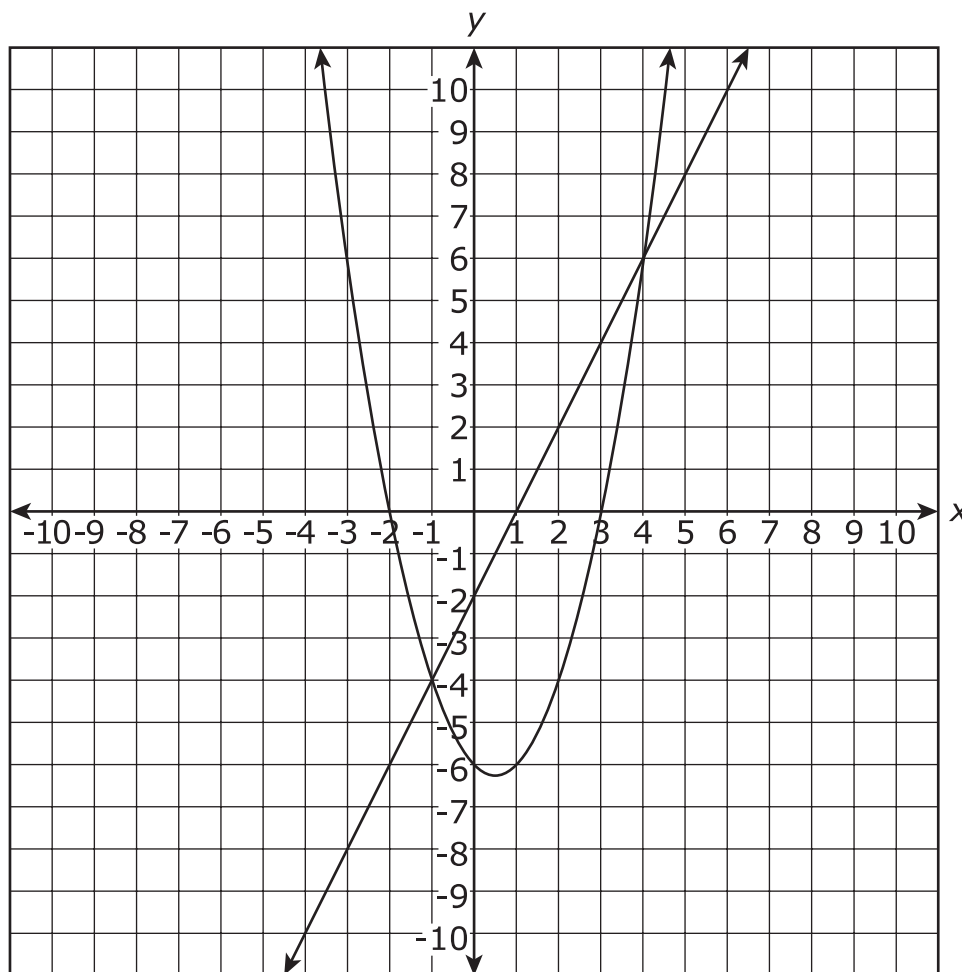
- 14** The equation $A = 1750(1.04)^t$ represents an account balance t years after the account was created.

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 two functions is shown on the coordinate plane.



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

- M.** -2
- P.** -1
- R.** 1
- S.** 3
- T.** 4



- 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?

- M.** $(x - 6)^2 = 9$
- P.** $(x - 7)^2 = 22$
- R.** $(x + 7)^2 = 4.7$
- S.** $(x - 12)^2 = -27$



- 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?

Enter your answer in the space provided.

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

What is the average number of miles John must ride per day to reach his goal of 100 miles?

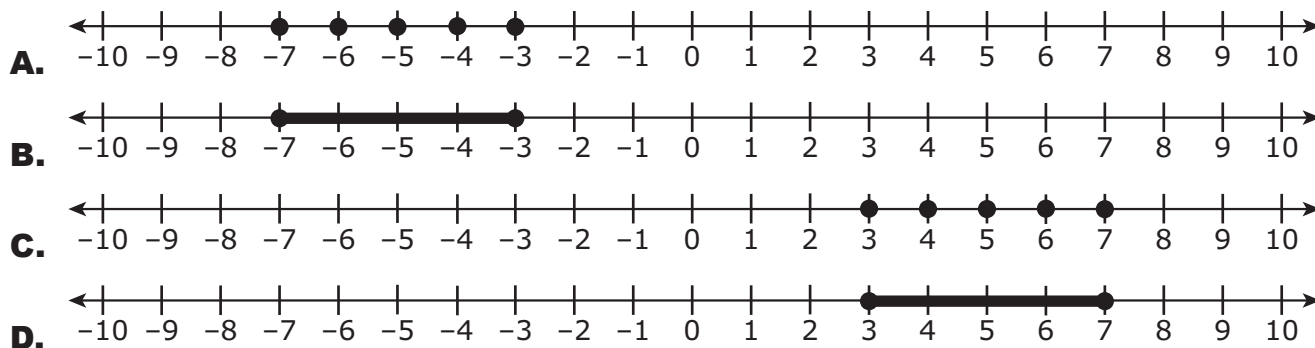
Enter your answer in the space provided.



- 20 Consider the function

$$f(x) = -2x^2 + 20x - 42.$$

Which graph shows **all** the values of x for which $f(x) \geq 0$?



**This is the end of Subpart 2 of the Algebra I Test.
Do not go on to the next page until told to do so.**



- 21** Hayden solved this equation using the steps shown.

$$|x - 3| = 4$$

Step 1: $x - 3 = 4$

Step 2: $x - 3 + 3 = 4 + 3$

Solution: $x = 7$

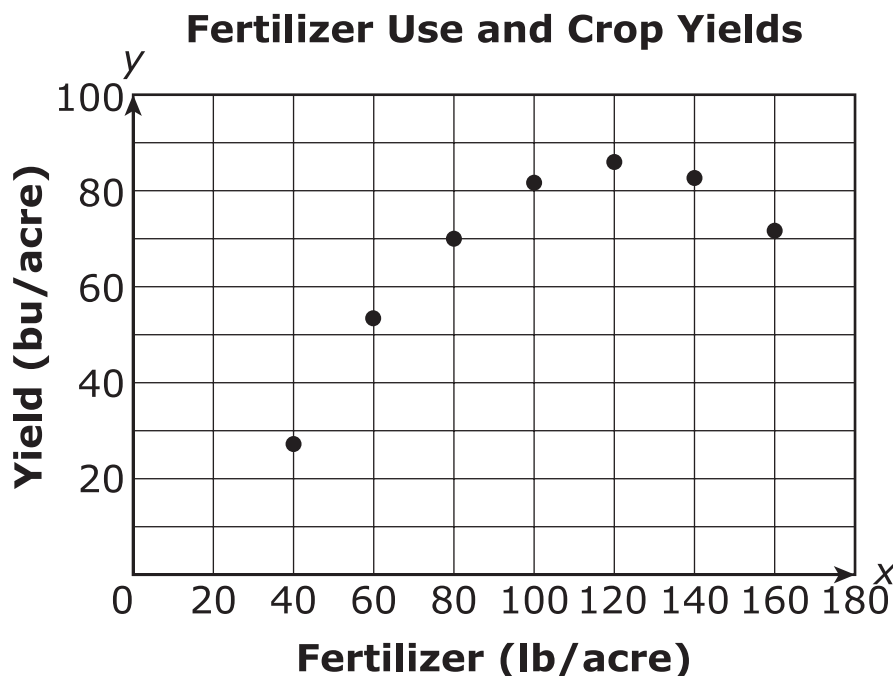
Based on the definition of absolute value, what additional step should Hayden do to determine the complete solution to the equation?

- A.** Hayden should include the opposite of 7 as a second solution.
- B.** Hayden should include the reciprocal of 7 as a second solution.
- C.** Hayden should also solve for $-x + 3 = -4$ to determine a second solution.
- D.** Hayden should also solve for $x - 3 = -4$ to determine a second solution.



- 22** A farmer performs an experiment to find the amount of fertilizer needed to increase crop yields. She uses different amounts of fertilizer, measured in pounds per acre (lb/acre). She then records the yields, in bushels per acre (bu/acre). Her results are shown in the table and graphed on the scatter plot.

Fertilizer (lb/acre)	Yield (bu/acre)
40	28
60	54
80	70
100	82
120	86
140	83
160	72



Which equation **best** models the farmer's data?

- M.** $y = 0.37x + 31$
- P.** $y = 32(1.006)^x$
- R.** $y = -0.009x^2 + 2.13x - 43$
- S.** $y = -0.009x^2 + 2.13x + 43$



- 23** Jackie buys 3 hot dogs and 1 pretzel from a restaurant for \$12.25. Sylvia buys 2 hot dogs and 4 pretzels from the same restaurant for \$16.50.

Part A

Which system of equations can be used to determine the price of a hot dog, h , and a pretzel, p , at the restaurant?

- A.** $2h + 1p = 12.25$
 $3h + 4p = 16.50$
- B.** $3h + 2h = 12.25$
 $1p + 4p = 16.50$
- C.** $2h + 4p = 12.25$
 $3h + 1p = 16.50$
- D.** $3h + 1p = 12.25$
 $2h + 4p = 16.50$

Part B

What is the price, in dollars, of a hot dog at the restaurant?

Enter your answer in the space provided.



- 24** The length of a garden is 6 feet more than the width. The area of the garden is 40 square feet.

What is the length, in feet, of the garden?

Enter your answer in the space provided.

- 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.

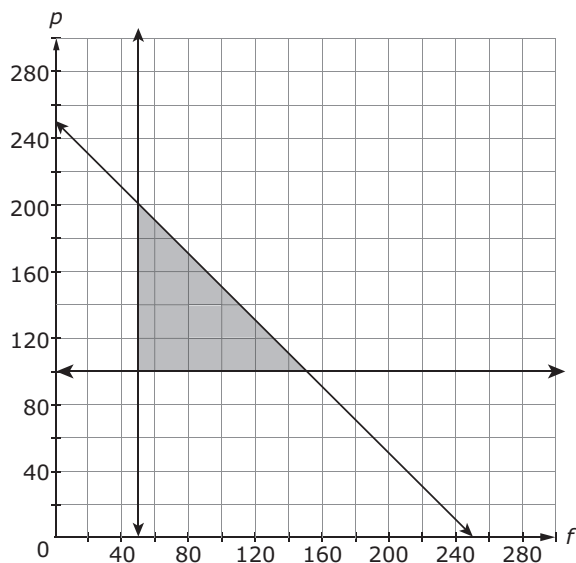
Enter your answer in the space provided.



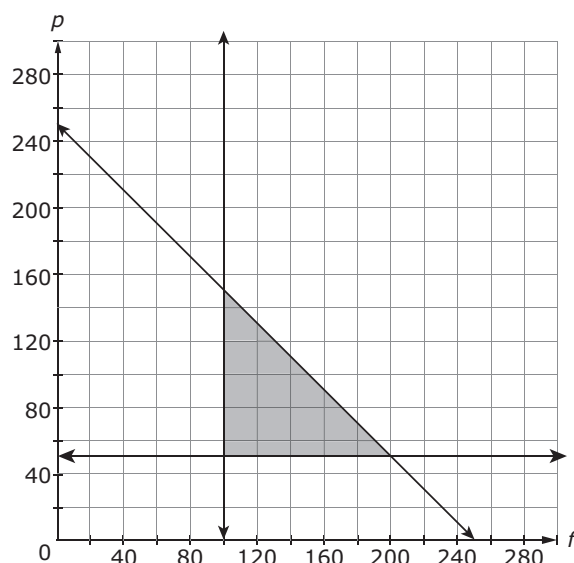
- 26** Karen is buying supplies for a party. She plans to spend at least \$100 on food and at least \$50 on party favors. She can spend no more than \$250 total on food and party favors.

Which graph shows the solution set to the amount of money Karen can spend on food, f , and party favors, p , and spend no more than \$250?

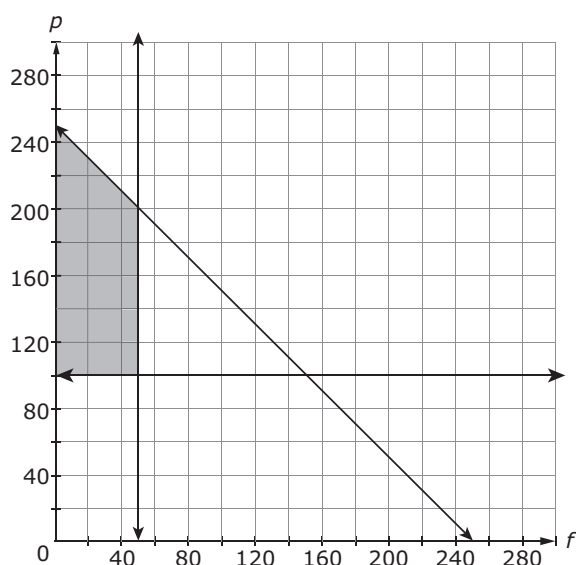
M.



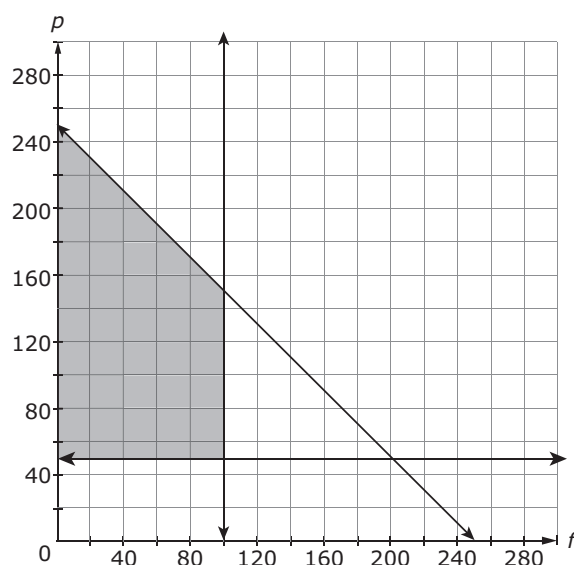
R.



P.



S.





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

What is the greatest value of x that makes the equation true?

Enter your answer in the space provided.

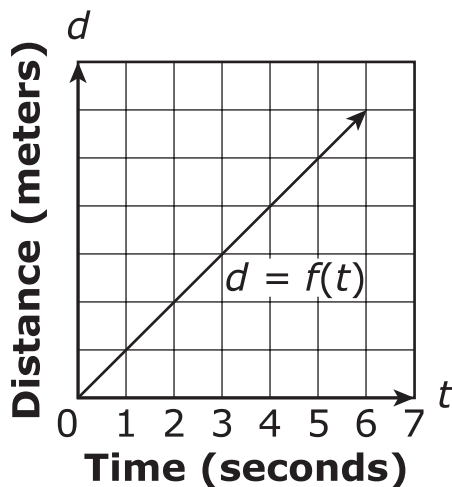
- 28** The function $g(z) = 400z - z^2$ can be used to determine the area, in square feet, of a field, where z represents the width of the field in feet. A farmer will plant spinach in this field and expects to harvest 1 pound of spinach per square foot.

If the field is 50 feet wide, what is the total number of pounds of spinach the farmer should expect to harvest from the field?

Enter your answer in the space provided.



- 29** The speed of sound at sea level, in dry air (70°F), is approximately 340 meters per second. Assume the graph correctly shows the distance, d , a sound wave created by a loud noise at sea level has traveled after t seconds.



Which set of numbers is **most** appropriate to label the seven tick marks along the vertical axis (distance)?

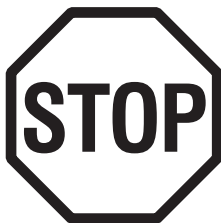
- A.** 1, 2, 3, 4, 5, 6, 7
- B.** 70, 140, 210, 280, 350, 420, 490
- C.** 100, 200, 300, 400, 500, 600, 700
- D.** 340, 680, 1020, 1360, 1700, 2040, 2380



- 30** A quadratic function is given as $f(x) = x^2 + 8x + 6$.

Rewrite the given function in an equivalent form that would reveal the vertex of the function.

Enter your answer in the space provided.



**This is the end of Subpart 3 of the Algebra I Test.
Do not go on to the next page until told to do so.**

Subpart 1 Practice Test Questions

1. ☐ A ☐ B ☐ C ☒
2. ☐ M ☐ P ☒ ☐ S
3. ☒ ☒ C ☐ D ☒ (select **all** that apply)
4. ☐ M ☐ P ☒ ☐ S
5. ☐ A ☒ ☐ C ☐ D
6. ☐ M ☒ ☐ R ☐ S
7. ☐ A ☐ B ☐ C ☒
8.

$-3x^4 + 9x^3 - 8x^2 - 2x + 12$
9. ☐ M ☐ P ☐ R ☒

Subpart 2 Practice Test Questions

10. ☐ A ☒ ☐ C ☒ ☒ (select **three**)
11. ☐ M ☒ ☐ R ☐ S
12. ☐ A ☐ B ☒ ☐ D
13. ☐ M ☒ ☒ ☒ ☐ T ☐ V (select **all** that apply)
14. ☐ A ☐ B ☐ C ☒
15. ☐ M ☒ ☐ R ☐ S ☒ (select **all** that apply)
16. ☐ A ☒ ☐ C ☐ D
17. ☒ ☐ P ☐ R ☐ S
18.

3072

19.

2.2

20.

☐ A ☐ B ☐ C ☒

Subpart 3 Practice Test Questions

21.

☐ A ☐ B ☐ C ☒

22.

☐ M ☐ P ☒ ☐ S

23.

Part A: ☐ A ☐ B ☐ C ☒

Part B:

3.25

24.

10

25.

$$v(t) = 25000(0.975)^t$$

26.

☐ M ☐ P ☒ ☐ S

27.

9

28.

17,500

29. ☐ A ☐ B ☐ C ☒

30.

$$f(x) = (x + 4)^2 - 10$$

TNReady Practice Test Standards Alignment and Key - Algebra I

Subpart 1	Key	Standard
1	D	A1.A.REI.A.1
2	R	A1.A.CED.A.2
3	A, B, E	A1.F.IF.A.1
4	R	A1.SI.D.C.7
5	B	A1.F.IF.C.6b
6	P	A1.A.SSE.A.2
7	D	A1.S.ID.A.2
8	$-3x^4 + 9x^3 - 8x^2 - 2x + 12$	A1.A.APR.A.1
9	S	A1.F.BF.B.2
Subpart 2		
10	B, D, E	A1.S.ID.A.3
11	P	A1.F.BF.A.1a
12	C	A1.A.REI.B.2
13	P, R, S	A1.A.APR.B.2
14	D	A1.A.SSE.A.1b
15	P, T	A1.A.REI.D.6
16	B	A1.F.LE.B.4
17	M	A1.A.REI.B.3a
18	3072	A1.F.IF.A.2
19	2.2	A1.A.CED.A.1
20	D	A1.F.IF.B.3
Subpart 3		
21	D	A1.A.REI.A.1
22	R	A1.S.ID.B.4a
23	D; 3.25	A1.A.REI.C.4
24	10	A1.A.CED.A.1
25	$v(t) = 25000(0.975)^t$	A1.F.LE.A.2
26	R	A1.A.CED.A.3
27	9	A1.A.REI.B.3b
28	17,500	A1.F.IF.A.2
29	D	A1.N.Q.A.1
30	$f(x) = (x + 4)^2 - 10$	A1.A.SSE.B.3b