Tennessee Comprehensive Assessment Program

TCAP

Integrated Math II
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.

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: $S_n = \frac{a_1\left(1 - r^n\right)}{1 - r}$

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

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

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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)

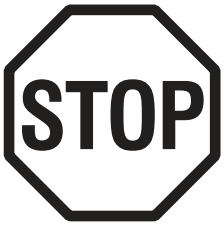
Which expression is equivalent to $\frac{x^2 + 2x - 24}{3x + 18}$?

A. $\frac{x - 4}{3}$

B. $\frac{x + 6}{3x + 6}$

C. $\frac{x - 4}{x + 6}$

D. $\frac{x^2 + 2x - 4}{3x^2 + 3}$



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

1 Which expression is equivalent to $\sqrt[5]{w^3}$?

A. $\frac{w^3}{w^5}$

B. $\frac{w^5}{w^3}$

C. $\left(w^{\frac{1}{3}}\right)^5$

D. $\left(w^{\frac{1}{5}}\right)^3$

2 Fannie is making a rectangular blanket. The length of the blanket is 10 inches greater than its width, w, in inches.

Write the function, $f(w)$, that describes the area, in square inches, of Fannie's blanket as a function of the width, w.

Enter your answer in the space provided.

3 Simplify the expression $(2 - 3i)(4 + 2i)$.

M. 14

P. $6i$

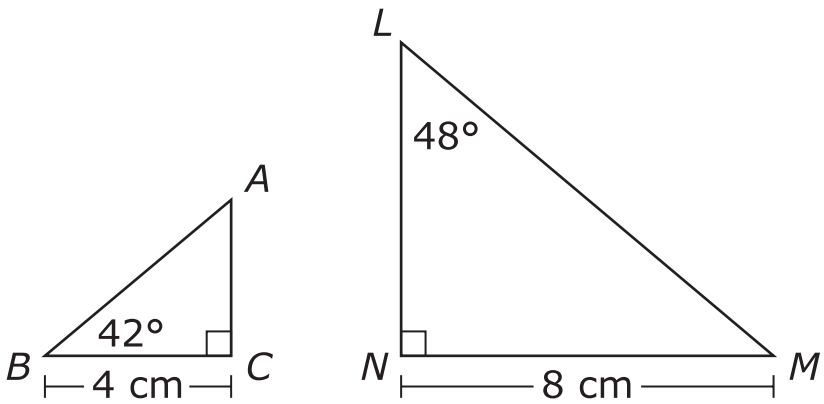
R. $2 - 8i$

S. $14 - 8i$

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

Enter your answer in the space provided.

5 Determine which statement is true in regard to $\triangle ABC$ and $\triangle LMN$.



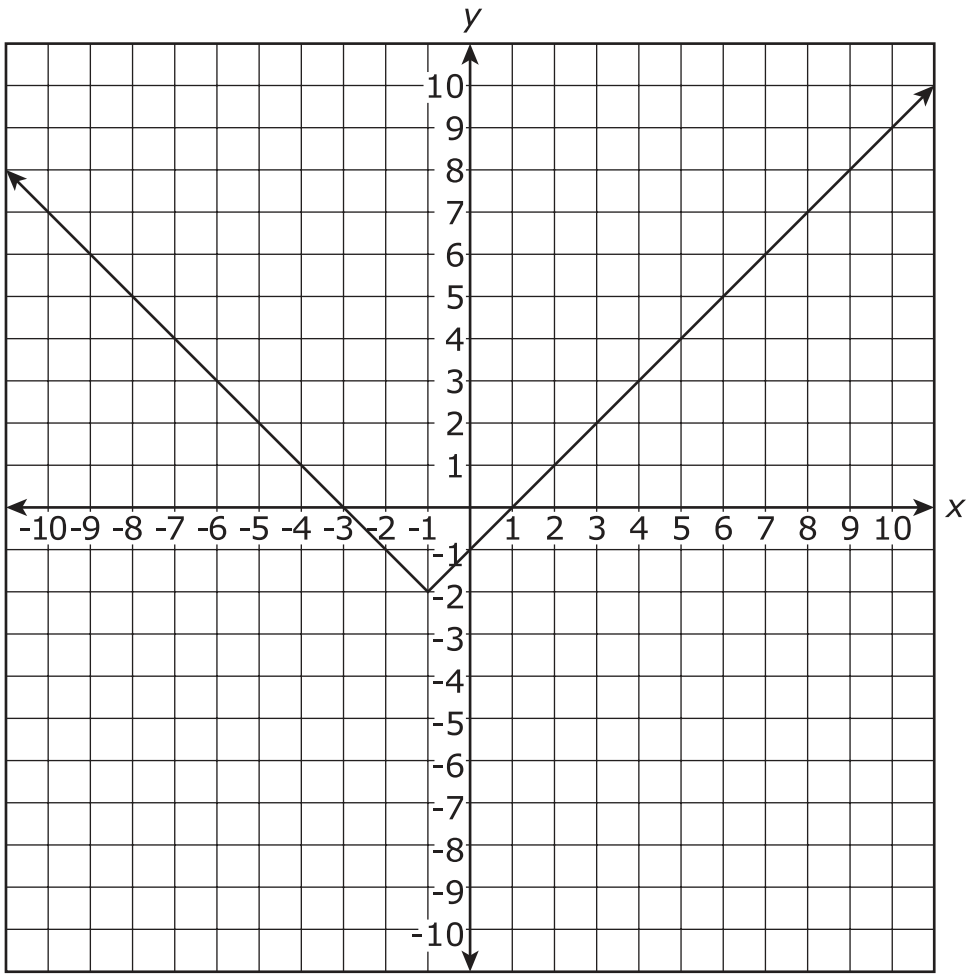
A. $\triangle ABC \sim \triangle LMN$ by AA criterion.

B. $\triangle ABC \sim \triangle LMN$ by SAS criterion.

C. $\triangle ABC \sim \triangle LMN$ by SSS criterion.

D. $\triangle ABC$ and $\triangle LMN$ are not similar.

6 A function is graphed on the coordinate plane.



Which equation represents the graphed function?

M. $f(x) = |x + 2| - 1$

P. $f(x) = |x + 1| - 2$

R. $f(x) = |x - 2| + 1$

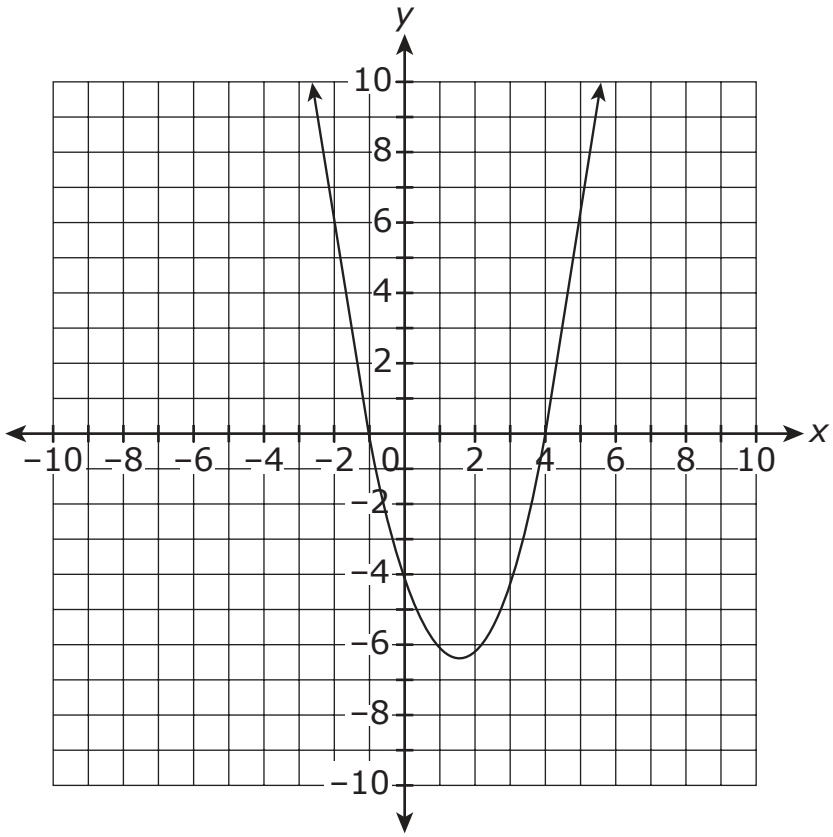
S. $f(x) = |x - 1| + 2$

7 Multiply the following polynomials.

$(x - 7)(3x^2 + 8)$

Enter your answer in the space provided.

8 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

9 A student followed the steps shown to solve the given equation.

Given: $9x^2 + 15 = 24$

Step 1: $9x^2 = 9$

Step 2: $x^2 = 81$

Step 3: $x = \pm 9$

Which statement is true about the steps the student used to solve the equation?

M. From the given equation to Step 1, the student should have added 15 to both sides of the equation.

P. From Step 1 to Step 2, the student should have divided both sides of the equation by 9.

R. From Step 2 to Step 3, the student should have squared both sides of the equation.

S. The student made no mistake, so the solution is correct.

This is the end of Subpart 1 of the Integrated Math II Test.
Do not go on to the next page until told to do so.

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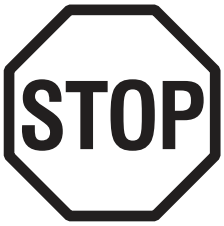
Directions

Subpart 2 of this test contains various types of assessment questions.

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



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10 Consider the equation

$$x^2 - 12x + 49 = 22.$$

Which equation has the **same** solution(s) as the given equation?

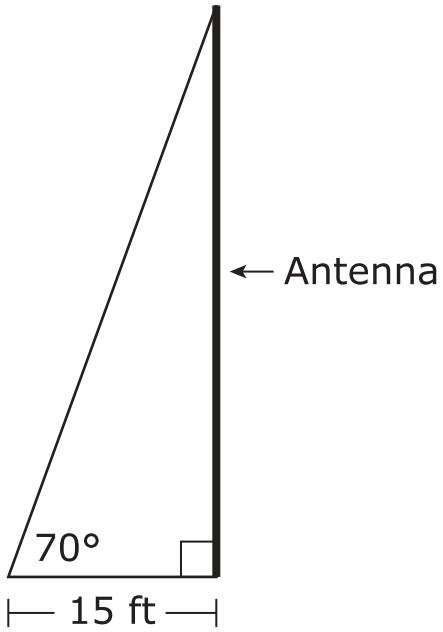
A. $(x - 6)^2 = 9$

B. $(x - 7)^2 = 22$

C. $(x + 7)^2 = 4.7$

D. $(x - 12)^2 = -27$

11 A support wire is attached to the top of an antenna. The support wire connects to the ground 15 feet from the bottom of the antenna. The support wire and the ground meet at an angle with measure 70°, as shown.



To the nearest foot, what is the height of the antenna?

Enter your answer in the space provided.

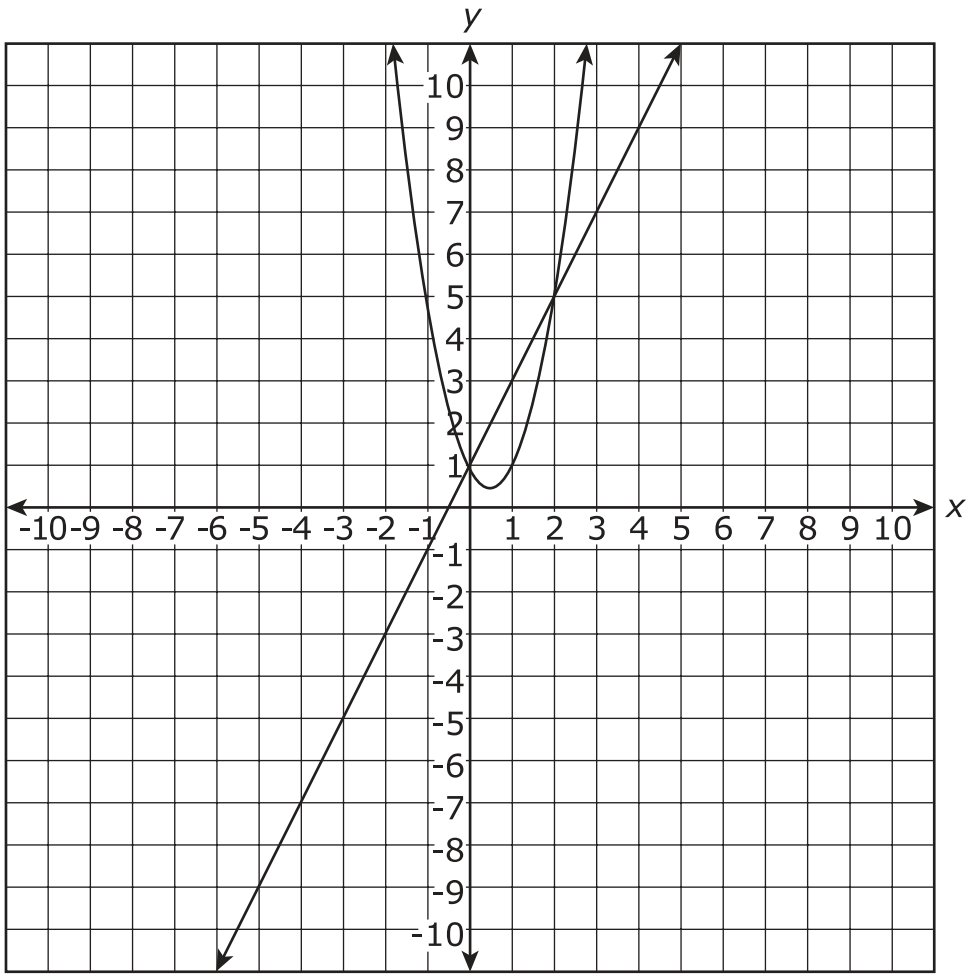
12 A survey asked 410 students whether they would eat food served in the school cafeteria. The results are recorded in the table shown.

Grade	Yes	No
9th	67	33
10th	63	47
11th	32	68
12th	12	88

What is the probability that a student will **not** eat food served in the school cafeteria, given that the student is in 10th grade?

Enter your answer, rounded to the nearest hundredth, in the space provided.

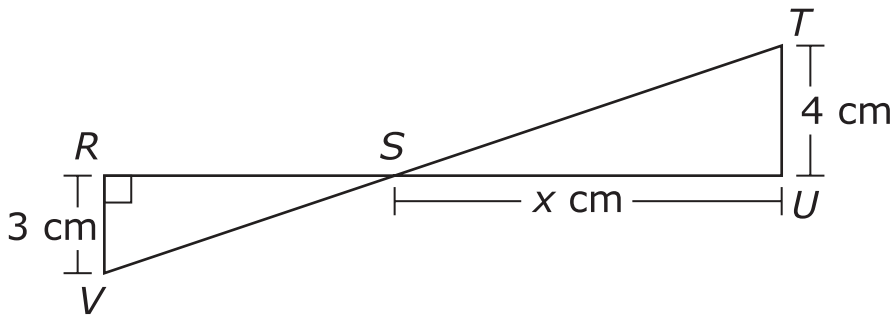
13 The graph of a system of equations is shown.



What is the *x*-coordinate of one of the solutions to the system of equations?

Enter your answer in the space provided.

14 $\triangle RSV \sim \triangle UST$



Select the **two** statements that must be true.

M. $\triangle STU$ is a right triangle.

P. $\overline{RS}$ is $\frac{4}{3}x$ cm in length.

R. $\angle VRS \cong \angle STU$

S. $\overline{SV} \cong \overline{ST}$

T. $m\angle RVS + m\angle UST = 90°$

15 A healthcare company surveys customers to determine whether each customer would be willing to pay an additional $35 monthly for extra coverage. The results of the survey are shown.

Would you pay extra?

Age	Yes	No
Below 50	38	55
50 or older	45	22

What is the probability a customer below the age of 50 would be willing to pay an extra $35 monthly?

Enter your answer in the space provided.

16 The chart gives the number of people owning cell phones as a function of years.

Years	Number (in millions)
1977	2.1
1978	2.4
1979	2.6
1980	3.0
1981	3.3
1982	3.7
1983	4.1

The number of people owning cell phones, $N(t)$, is modeled by the equation $N(t) = A_0P^t$, where P is a constant and t represents the number of years since 1977.

What is the value of A_0?

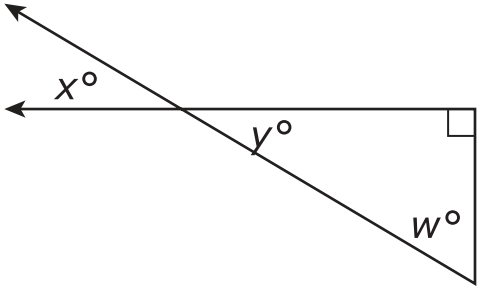
A. 0.30

B. 2.0

C. 1.80

D. 2.1

17 In the figure shown, $\cos(w°) = 0.60$.



What is $\sin(x°)$?

M. 0.36

P. 0.40

R. 0.60

S. 0.80

18 The length of a rectangle is 7 inches longer than its width. The area of the rectangle is 260 square inches.

What is the length, in inches, of the rectangle?

Enter your answer in the space provided.

19 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.

This is the end of Subpart 2 of the Integrated Math II Test.
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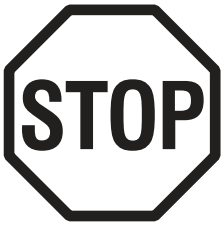
Directions

Subpart 3 of this test contains various types of assessment questions.

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



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

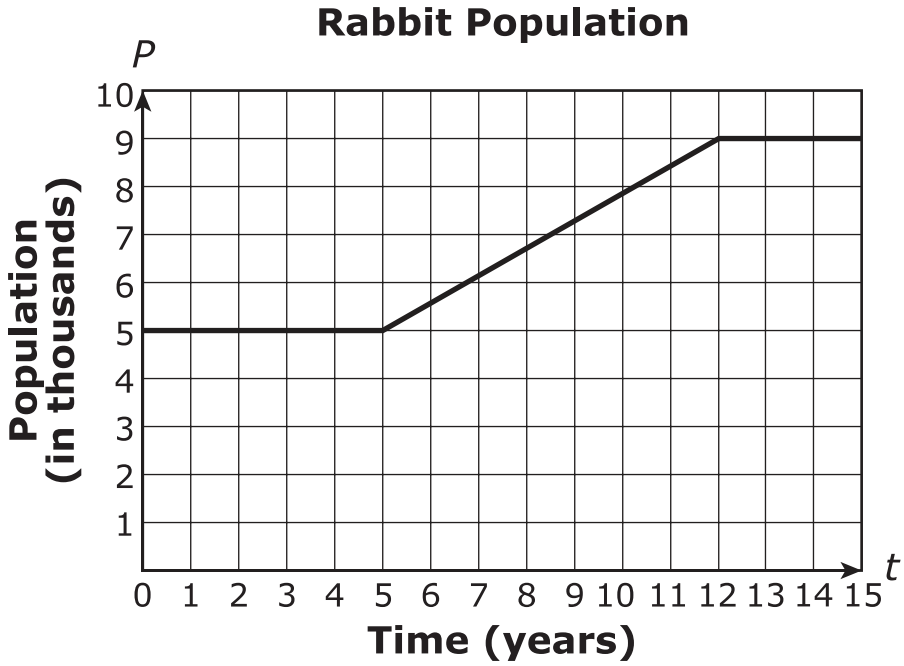
What is the greatest value of x that makes the equation true?

Enter your answer in the space provided.

21 What is one solution to $2x^2 - 3x + 3 = 0$?

Enter your answer in the space provided.

22 This graph shows the population of rabbits in a certain area as a function of the time in years.



During which time interval is the population of rabbits increasing?

A. [0,5]

B. [5,12]

C. [0,12]

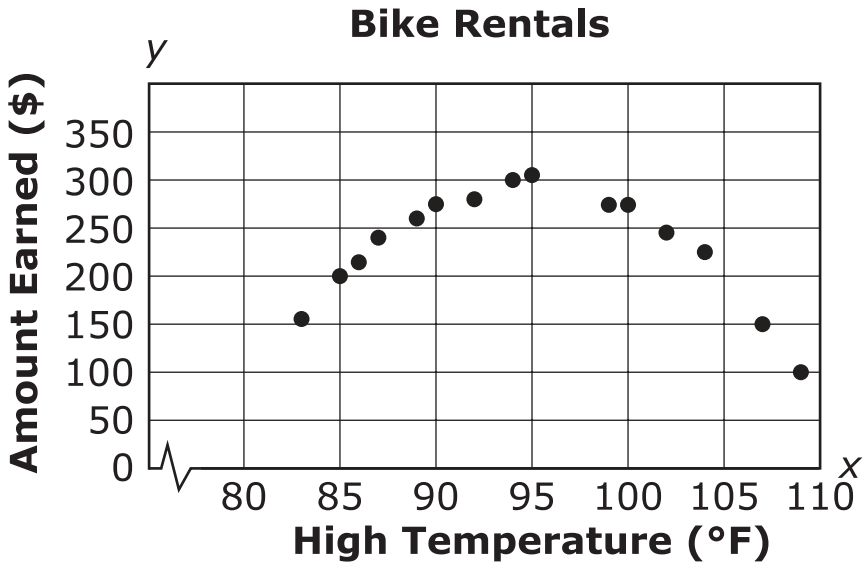
D. [12,15]

23 The length of one side of a shoebox is 8 centimeters more than twice the width. The base of the shoebox has an area of 72 square centimeters.

Write an equation to represent this situation with w representing the width in centimeters.

Enter your answer in the space provided.

24 Ashley owns a bike rental shop in Arizona. She recorded the high temperature and the amount of money she earned from bike rentals for 15 different days during the summer. The graph shows the data.



Which equation **best** fits the data?

M. $y = (x - 95)^2 + 300$

P. $y = -(x - 95)^2 + 300$

R. $y = (x - 95)(x - 300)$

S. $y = -(x - 95)(x - 300)$

25 There are 65 adults and 15 children in a movie theater. Of these people, 41 adults and 6 children bought popcorn.

What is the probability that a randomly selected person in the movie theater is an adult or someone who did **not** buy popcorn?

Enter your answer, as a decimal, in the space provided.

26 The dimensions of a rectangular prism are 26 inches by 10 inches by 8 inches. What is the surface area, in square inches, of the prism?

A. 548

B. 936

C. 1,096

D. 2,080

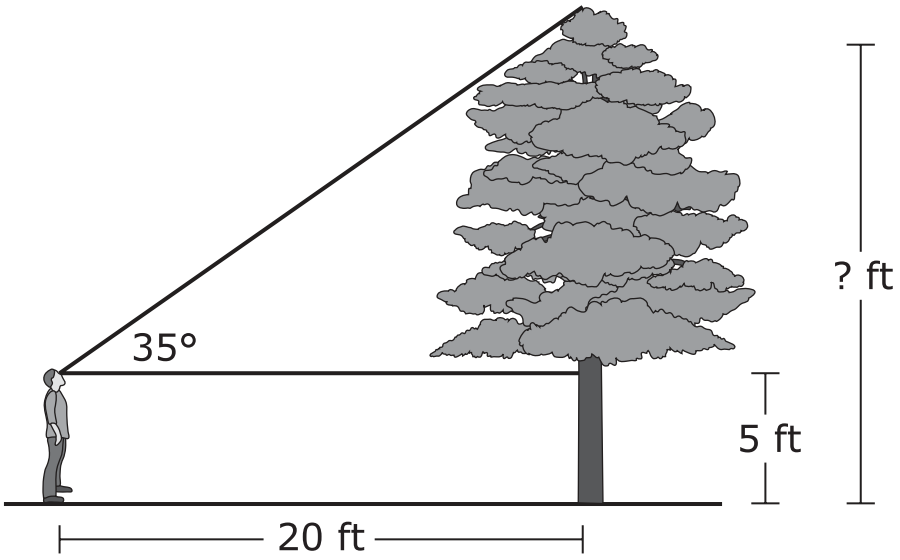
27 The table shows the depth of water in a pond as it is being filled.

Time, *t* (minutes)	0	1	2	3	4	5	6
Depth, *d* (meters)	0	0.78	0.98	1.13	1.24	1.34	1.42

What is the average rate of change, in meters per minute, of the depth of the water in the pond, between $t = 2$ and $t = 5$? Round your answer to the nearest hundredth.

Enter your answer in the space provided.

28 Chris is looking up at the top of a tree. He is standing 20 feet from the tree, and his line of sight is 35° from horizontal. His eyes are 5 feet above the ground.



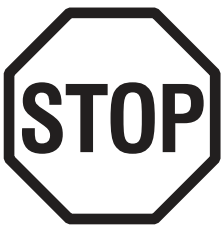
To the nearest foot, how tall is the tree?

Enter your answer in the space provided.

29 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.



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Name: _____

Subpart 1 Practice Test Questions

1. Ⓐ Ⓑ Ⓒ Ⓓ

2.

3. Ⓜ Ⓟ Ⓡ Ⓢ

4.

5. Ⓐ Ⓑ Ⓒ Ⓓ

6. Ⓜ Ⓟ Ⓡ Ⓢ

7.

8. Ⓐ Ⓑ Ⓒ Ⓓ

9. Ⓜ Ⓟ Ⓡ Ⓢ

Subpart 2 Practice Test Questions

10. Ⓐ Ⓑ Ⓒ Ⓓ

11.

12.

13.

14. Ⓜ Ⓟ Ⓡ Ⓢ Ⓣ (Select **two**)

15.

16. Ⓐ Ⓑ Ⓒ Ⓓ

17. Ⓜ Ⓟ Ⓡ Ⓢ

18.

19.

Subpart 3 Practice Test Questions

20.

21.

22. Ⓐ Ⓑ Ⓒ Ⓓ

23.

24. Ⓜ Ⓟ Ⓡ Ⓢ

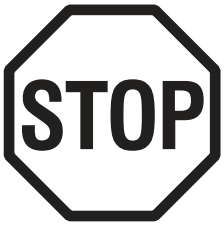
25.

26. Ⓐ Ⓑ Ⓒ Ⓓ

27.

28.

29.



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Subpart 1 Practice Test Questions

1. Ⓐ Ⓑ Ⓒ ●

2. $f(w) = w(w + 10)$

3. Ⓜ Ⓟ Ⓡ ●

4. $-3x^4 + 9x^3 - 8x^2 - 2x + 12$

5. ● Ⓑ Ⓒ Ⓓ

6. Ⓜ ● Ⓡ Ⓢ

7. $3x^3 - 21x^2 + 8x - 56$

8. Ⓐ Ⓑ Ⓒ ●

9. Ⓜ ● Ⓡ Ⓢ

Subpart 2 Practice Test Questions

10. ● Ⓑ Ⓒ Ⓓ

11. 41

12. 0.43

13. 0 or 2

14. ● Ⓟ Ⓡ Ⓢ ●

15.

0.40-0.41

16. Ⓐ Ⓑ Ⓒ ●

17. Ⓜ Ⓟ ● Ⓢ

18.

20

19.

10

Subpart 3 Practice Test Questions

20.

9

21.

$\frac{3+i\sqrt{15}}{4}$ or $\frac{3-i\sqrt{15}}{4}$ or equivalent

22. Ⓐ ● Ⓒ Ⓓ

23.

$2w^2 + 8w = 72$ or equivalent equation

24. Ⓜ ● Ⓡ Ⓢ

25.

0.925

26. Ⓐ Ⓑ ● Ⓓ

27.

0.12

28.

19

29.

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

Department of Education

TNReady Practice Test Standards Alignment and Key – Integrated Math II

Subpart 1	Key	Standard
1	D	M2.N.RN.A.2
2	$f(w) = w(w + 10)$	M2.F.BF.A.1a
3	S	M2.N.CN.A.2
4	$-3x^4 + 9x^3 - 8x^2 - 2x + 12$	M2.A.APR.A.1
5	A	M2.G.SRT.A.3
6	P	M2.F.IF.B.4b
7	$3x^3 - 21x^2 + 8x - 56$	M2.A.APR.A.1
8	D	M2.F.BF.B.2
9	P	M2.A.REI.A.1
Subpart 2		
10	A	M2.A.REI.B.2
11	41	M2.G.SRT.C.8
12	0.43	M2.S.CP.A.3
13	0 or 2	M2.A.REI.C.4
14	M, T	M2.G.SRT.B.4
15	0.40–0.41	M2.S.CP.A.3
16	D	M2.F.IF.A.1
17	R	M2.G.SRT.C.7
18	20	M2.A.CED.A.1
19	10	M2.A.CED.A.1
Subpart 3		
20	9	M2.REI.B.2b
21	$\frac{3+i\sqrt{15}}{4}$ or $\frac{3-i\sqrt{15}}{4}$ or equivalent	M2.N.CN.B.3
22	B	M2.N.Q.A.1
23	$2w^2 + 8w = 72$ or equivalent equation	M2.A.CED.A.2
24	P	M2.S.ID.A.1a
25	0.925	M2.S.CP.B.6
26	C	M2.G.GMD.A.2
27	0.12	M2.F.IF.A.3
28	19	M2.G.SRT.C.8a
29	$f(x) = (x + 4)^2 - 10$	M2.A.SSE.B.3b

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