Algebra 2
High School Review

Name _____

SBAC Released Questions
High School

1) Select the expression that is equivalent to $(m^2 - 25)$.

Ⓐ $(m^2 - 10m + 25)$

Ⓑ $(m^2 + 10m + 25)$

Ⓒ $(m - 5)(m + 5)$

Ⓓ $(m - 5)^2$

2) Select an expression that is equivalent to $\sqrt{3^8}$.

Ⓐ $3^{\frac{1}{4}}$

Ⓑ 3^3

Ⓒ 3^4

Ⓓ 3^6

3) Click the table to indicate whether each equation has no real solution, one real solution, or infinitely many real solutions.

	No Real Solution	**One Real Solution**	**Infinitely Many Real Solutions**
$\frac{5}{20x} = \frac{1}{4x}$	☐	☐	☐
$3x = 4 + 5x$	☐	☐	☐
$\sqrt{2x + 3} + 6 = 0$	☐	☐	☐

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4) Enter an expression equivalent to $(3x^2 + 2y^2 - 3x) + (2x^2 + y^2 - 2x) - (x^2 + 3y^2 + x)$ using the fewest number of possible terms.

5) A student solved $\frac{3}{x-4} = \frac{x}{7}$ in six steps, as shown.

Step 1: $3 = \frac{x(x-4)}{7}$

Step 2: $21 = x(x - 4)$

Step 3: $21 = x^2 - 4x$

Step 4: $0 = x^2 - 4x - 21$

Step 5: $0 = (x - 7)(x + 3)$

Step 6: $x = -3, x = 7$

Which statement is an accurate interpretation of the student's work?

Ⓐ The student solved the equation correctly.

Ⓑ The student made an error in step 2.

Ⓒ The student made an error in step 5.

Ⓓ Only $x = 7$ is a solution to the original equation.

6) Which inequality represents all possible solutions of $-6n < -12$?

Ⓐ $n < 72$

Ⓑ $n > 2$

Ⓒ $n < 2$

Ⓓ $n > 72$

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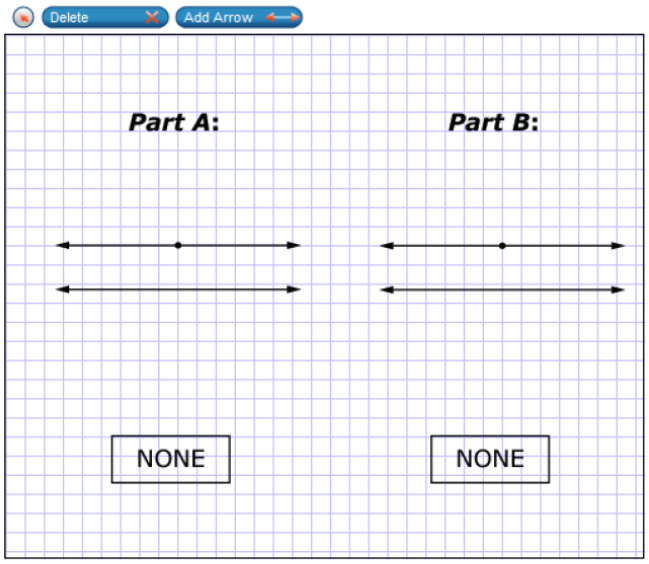
7) When a transversal intersects a pair of parallel lines it will create two pairs of alternate exterior angles.

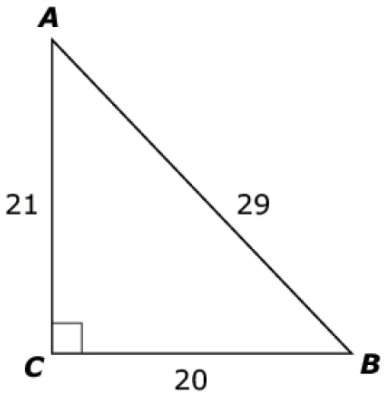
Ricky claims the angles within each pair are congruent to each other, but not congruent to either angle in the other pair.

Part A
Draw a transversal through the point that supports Ricky's claim or select **NONE** if there is not a situation to support the claim.

Part B
Draw a transversal through the point that **refutes** Ricky's claim, or select **NONE** if there is not a situation to refute the claim.



8) Consider this right triangle.



Enter the ratio equivalent to sin(B).

9) A train travels 250 miles at a constant speed (x), in miles per hour.

Enter an equation that can be used to find the speed of the train, if the time to travel 250 miles is 5 hours.

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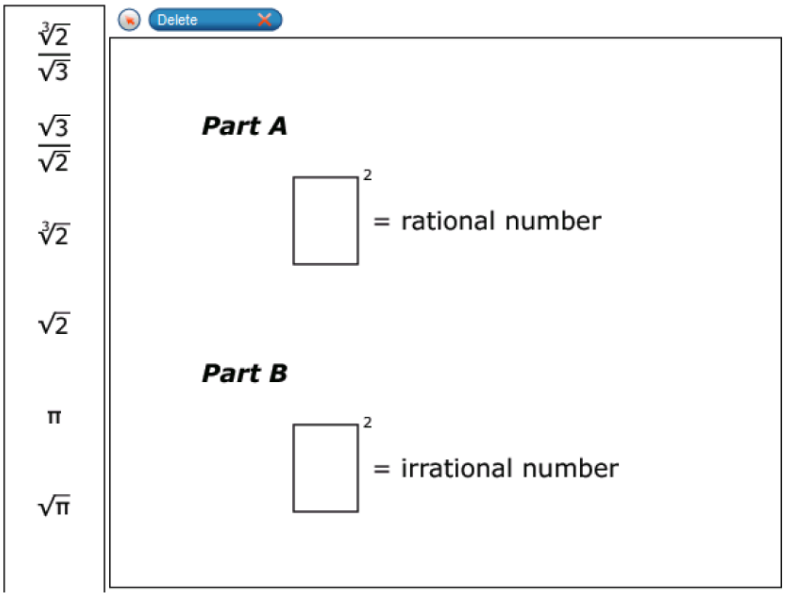
10) Cheryl claims that any irrational number squared will result in a rational number.

Part A

Drag an irrational number into the first response box that when squared will result in a rational number.

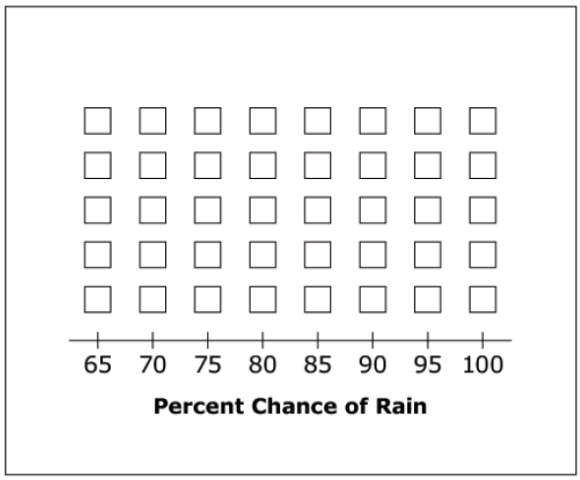
Part B

Drag an irrational number into the second response box that when squared will result in an irrational number.



11) Click above the numbers to create a line plot for the given percent chances of rain in different cities.

65, 65, 70, 70, 80, 80, 80, 80, 85, 95, 95, 95, 100



12) Emily is solving the equation $2(x + 9) = 4(x + 7) + 2$. Her steps are shown.

Part A
Click on the first step in which Emily made an error.

Part B
Click on the solution to Emily's original equation.

Part A

Step 1: $2(x + 9) = 4(x + 7) + 2$

Step 2: $2x + 18 = 4x + 28 + 2$

Step 3: $2x + 18 = 4x + 26$

Step 4: $-8 = 2x$

Step 5: $-4 = x$

Part B

−10.5 −6 −2 0 2 4.5 8

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13) The formula for the rate at which water is flowing is $R = \frac{V}{t}$, where

- R is the rate,
- V is the volume of water measured in gallons (g), and
- t is the amount of time, in seconds (s), for which the water was measured.

Select an appropriate measurement unit for the rate.

Ⓐ gs

Ⓑ $\frac{g}{s}$

Ⓒ $\frac{s}{g}$

Ⓓ $\frac{1}{sg}$

14) Match each recursive function with the equivalent explicit function.

	$f(n) = 6^{(n-1)}$; $n \geq 1$	$f(n) = 12 + 6n$; $n \geq 1$	$f(n) = 12^{(n-1)}$; $n \geq 1$	$f(n) = 6 + 12n$; $n \geq 1$
$f(1) = 18$; $f(n) = f(n-1) + 6$; $n \geq 2$	☐	☐	☐	☐
$f(1) = 18$; $f(n) = f(n-1) + 12$; $n \geq 2$	☐	☐	☐	☐
$f(1) = 1$; $f(n) = 6f(n-1)$; $n \geq 2$	☐	☐	☐	☐
$f(1) = 1$; $f(n) = 12f(n-1)$; $n \geq 2$	☐	☐	☐	☐

15) Write an expression equivalent to $\frac{b^{11}}{b^4}$ in the form b^m.

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16) A store sells used and new video games. New video games cost more than used video games. All used video games cost the same. All new video games also cost the same.

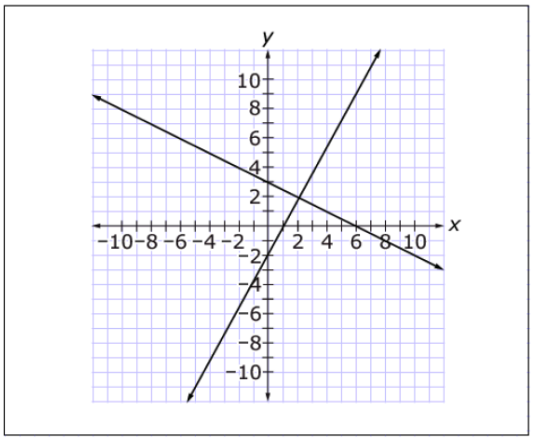
Omar spent a total of $84 on 4 used video games and 2 new video games. Sally spent a total of $78 on 6 used video games and 1 new video game. Janet has $120 to spend.

Enter the number of used video games Janet can purchase after she purchases 3 new video games.

17) Click on the region of the graph that contains the solution set of the system of linear inequalities.

$y \leq -\frac{1}{2}x + 3$

$y \geq 2x - 2$



18) Consider a sequence whose first five terms are: $-1.75,\ -0.5,\ 0.75,\ 2,\ 3.25$

Which function (with domain all integers $n \geq 1$) could be used to define and continue this sequence?

(A) $f(n) = \frac{7}{4}(n-1) - \frac{5}{4}$

(B) $f(n) = \frac{5}{4}(n-1) - \frac{7}{4}$

(C) $f(n) = \frac{7}{4}n - \frac{5}{4}$

(D) $f(n) = \frac{5}{4}n - \frac{7}{4}$

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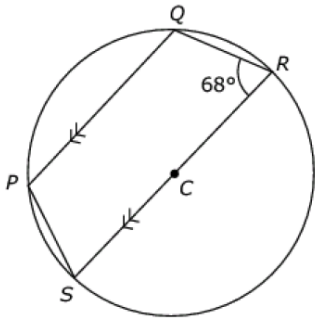
19) Use the circle below to answer the question.



The circle is centered at point *C*. Line segment *PQ* is parallel to *SR*. What is the measure of angle *QPS*?

Ⓐ 68°

Ⓑ 112°

Ⓒ 136°

Ⓓ 158°

20) A student earns $7.50 per hour at her part-time job. She wants to earn at least $200.

Enter an inequality that represents all of the possible numbers of hours (h) the student could work to meet her goal. Enter your response in the first response box.

Enter the least whole number of hours the student needs to work in order to earn at least $200. Enter your response in the second response box.

21) Michael took 12 tests in his math class. His lowest test score was 78. His highest test score was 98. On the 13th test, he earned a 64. Select whether the value of each statistic for his test scores increased, decreased, or could not be determined when the last test score was added.

	Standard Deviation	Median	Mean
Increased	☐	☐	☐
Decreased	☐	☐	☐
Could Not Be Determined	☐	☐	☐

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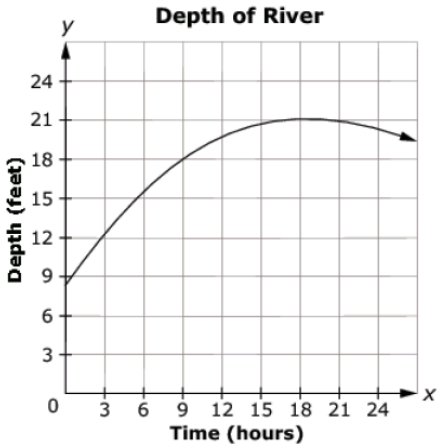
22) The basketball team sold t-shirts and hats as a fund-raiser. They sold a total of 23 items and made a profit of $246. They made a profit of $10 for every t-shirt they sold and $12 for every hat they sold.

Determine the number of t-shirts and the number of hats the basketball team sold.

Enter the number of t-shirts in the first response box.

Enter the number of hats in the second response box.

23) The depth of a river changes after a heavy rainstorm. Its depth, in feet, is modeled as a function of time, in hours. Consider this graph of the function.



Enter the average rate of change for the depth of the river, measured as feet per hour, between hour 9 and hour 18. Round your answer to the nearest tenth.

24) Mike earns $6.50 per hour plus 4% of his sales.

Enter an equation for Mike's total earnings, E, when he works x hours and has a total of y sales, in dollars.

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25) Nina has some money saved for a vacation she has planned.

- The vacation will cost a total of $1600.
- She will put $150 every week into her account to help pay for the vacation.
- She will have enough money for the vacation in 8 weeks.

If Nina was able to save $200 a week instead of $150 a week, how many fewer weeks would it take her to save enough money for the vacation? Enter the result in the response box.

26) Consider this solution to a problem.

Problem: $-4(6-y)+4=-4$
Step 1: $-24-4y+4=-4$
Step 2: $-20-4y=-4$
Step 3: $-4y=16$
Step 4: $y=-4$

In the first response box, enter the number of the step where the mistake is made.

In the second response box, enter the correct solution to the problem.

27) A train travels 250 miles at a constant speed (x), in miles per hour.

Enter an equation that can be used to find the speed of the train, if the time to travel 250 miles is 5 hours.

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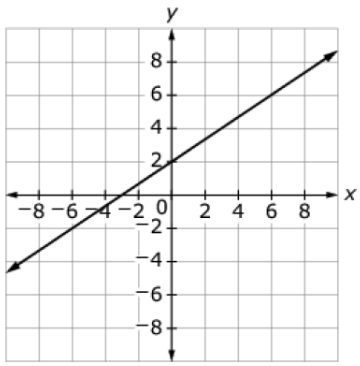
28) Choose the ordered pair that is a solution to the equation represented by the graph.



Ⓐ $(0, -3)$

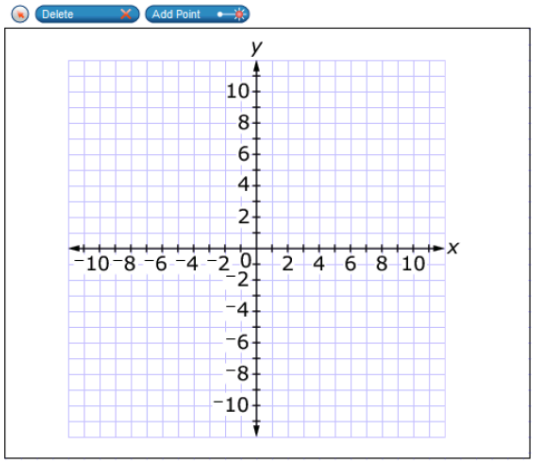
Ⓑ $(2, 0)$

Ⓒ $(2, 2)$

Ⓓ $(-3, 0)$

29) Given the function $y = 3x^2 - 12x + 9$,

- Place a point on the coordinate grid to show each x-intercept of the function.
- Place a point on the coordinate grid to show the minimum value of the function.



30) A student earns $7.50 per hour at her part-time job. She wants to earn at least $200.

Enter an inequality that represents all of the possible numbers of hours (h) the student could work to meet her goal. Enter your response in the first response box.

Enter the least whole number of hours the student needs to work in order to earn at least $200. Enter your response in the second response box.

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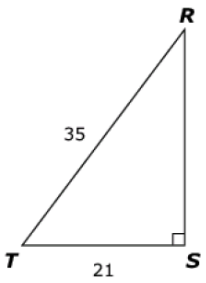
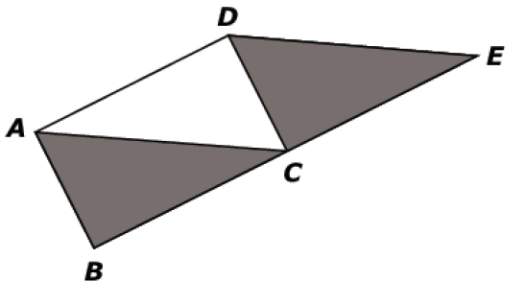
31) Consider this right triangle.



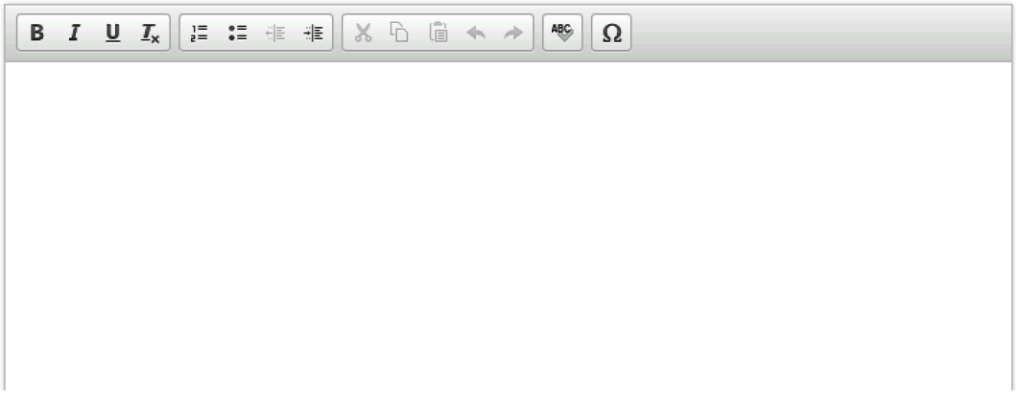
Determine whether each expression can be used to find the length of side *RS*. Select Yes or No for each expression.

	Yes	No
$35 \cdot sin(R)$	☐	☐
$21 \cdot tan(T)$	☐	☐
$35 \cdot cos(R)$	☐	☐
$21 \cdot tan(R)$	☐	☐

32) In the given figure, quadrilateral *ABCD* is a rectangle, and quadrilateral *ACED* is a parallelogram.



Ted claims that the two shaded triangles must be congruent. Is Ted's claim correct? Include all work and/or reasoning necessary to either prove the triangles congruent or to disprove Ted's claim.



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33) Emma is standing 10 feet away from the base of a tree and tries to measure the angle of elevation to the top. She is unable to get an accurate measurement, but determines that the angle of elevation is between 55 degrees and 75 degrees.

Decide whether each value given in the table is a reasonable estimate for the tree height. Select Reasonable or Not Reasonable for each height.

	Reasonable	Not Reasonable
4.2 feet	☐	☐
14.7 feet	☐	☐
24.4 feet	☐	☐
33.9 feet	☐	☐
39.1 feet	☐	☐
58.7 feet	☐	☐

34) Emily has a gift certificate for $10 to use at an online store. She can purchase songs for $1 each or episodes of TV shows for $3 each. She wants to spend exactly $10.

Part A

Create an equation to show the relationship between the number of songs, x, Emily can purchase and the number of episodes of TV shows, y, she can purchase.

Part B

Use the Add Point tool to plot **all** possible combinations of songs and TV shows Emily can purchase.