

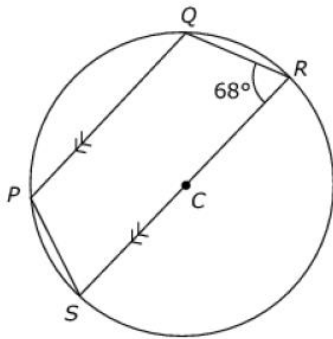


5. The formula for the rate at which water is flowing is  $R=V/t$ , where  
 R is the rate,  
 V is the volume of water measured in gallons (g), and  
 t is the amount of time, in seconds (s), for which the water was measured.  
 Select an appropriate measurement unit for the rate.

- |                  |                   |
|------------------|-------------------|
| a. gs            | c. $\frac{s}{g}$  |
| b. $\frac{g}{s}$ | d. $\frac{1}{sg}$ |

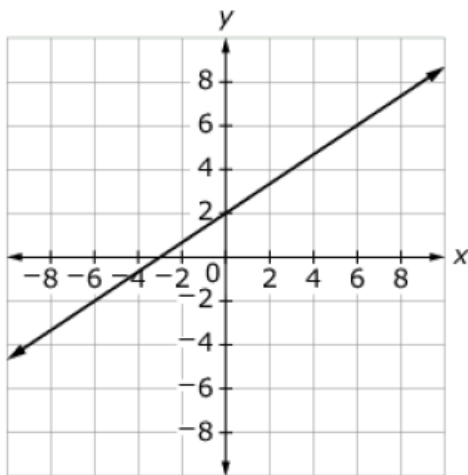
6. Use the circle below to answer the question.

The circle is center at point c. Line segment PQ is parallel to SR. What is the measure of angle QPS?



- |        |        |
|--------|--------|
| a. 68  | c. 136 |
| b. 112 | d. 158 |

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



- |           |           |
|-----------|-----------|
| a. (0,-3) | c. (2,2)  |
| b. (2,0)  | d. (-3,0) |

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

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

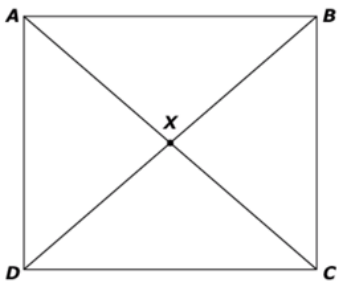
b.  $f(n) = \frac{5}{4}(n-1) - \frac{7}{4}$

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

### Multiple Response

Identify one or more choices that best complete the statement or answer the question.

9. Consider parallelogram ABCD with point x at the direction of diagonal segments AC and BD.



Evelyn claims the ABCD is a square. Select all statements that must be true for Evelyn's claim to be true.

a.  $AB=BD$

d.  $m\angle ABC \neq 90^\circ$

b.  $AD=AB$

e.  $m\angle AXC = 90^\circ$

c.  $AC=BX$

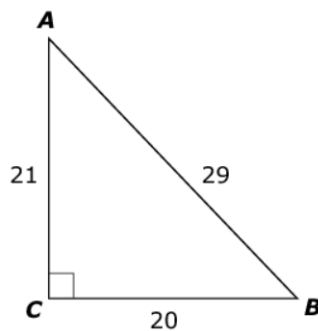
### Completion

Complete each statement.

10. Enter an expression equivalent to using the fewest number of possible terms.

$$(3x^2 + 2y^2 - 3x) + (2x^2 + y^2 - 2x) - (x^2 + 3y^2 + x)$$

11. Consider this right triangle.



Enter the ratio equivalent to  $\sin(B)$ .

12. 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 to 250 miles is 5 hours.

13. 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.

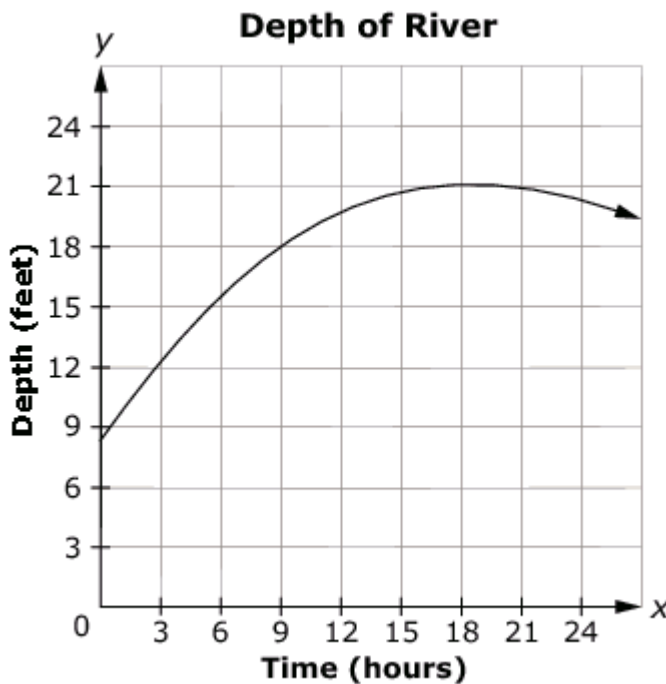
Omar spent a total of \$84 on 4 used video games and 2 new video games. Sally spent a total of \$78 on 6 used video games and 1 new video. Janet has \$120 to spend

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

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

15. 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.



16. 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? Enter the result in the response box.

17. A student earns \$7.50 per hour at hour at art-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.

18. 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.

19.

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.

### Matching

Indicate whether each equation has no real solution, one real solution, or infinitely many real solutions.

1.  $\frac{5}{20x} = \frac{1}{4x}$

2.  $3x = 4 + 5x$

3.  $\sqrt{2x+3} + 6 = C$

a. No Real Solution

b. One Real Solution

c. Infinity Many Real Solutions

\_\_\_ 20.  $\frac{5}{20x} = \frac{1}{4x}$

\_\_\_ 21.  $3x = 4 + 5x$

\_\_\_ 22.  $\sqrt{2x+3} + 6 = C$

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.

a.  <sup>2</sup> = rational number

b.  <sup>2</sup> = irrational number

\_\_\_ 23.  $\frac{\sqrt[3]{2}}{\sqrt{3}}$

\_\_\_ 24.  $\frac{\sqrt{3}}{\sqrt{2}}$

\_\_\_ 25.  $\sqrt[3]{2}$

\_\_\_ 26.  $\sqrt{2}$

\_\_\_ 27.  $\pi$

\_\_\_ 28.  $\sqrt{\pi}$

Emma is standing 10 feet away from the base of a tree and tries to measure the angles 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.

a. Select Reasonable

b. Not Reasonable

\_\_\_ 29. 4.2 feet

\_\_\_ 30. 14.7 feet

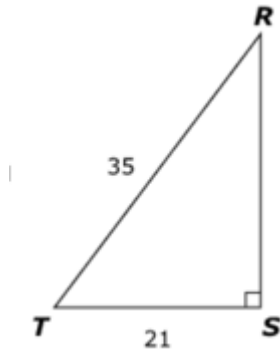
\_\_\_ 31. 24.4 feet

\_\_\_ 32. 33.9 feet

\_\_\_ 33. 39.1 feet

\_\_\_ 34. 58.7 feet

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.

a. Yes

b. No

\_\_\_ 35.  $35 \cdot \sin(\angle R)$

\_\_\_ 36.  $21 \cdot \tan(\angle T)$

\_\_\_ 37.  $35 \cdot \cos(\angle R)$

\_\_\_ 38.  $21 \cdot \tan(\angle R)$

### Other

39. 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 Rick's claim, or select NONE if there is not a situation to support the claim.

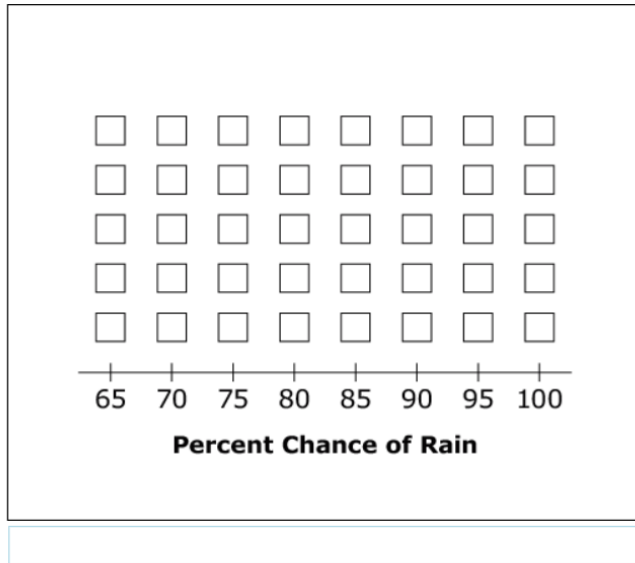
Part B

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

Part A: NONE

Part B: NONE

40. 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, 100



41. 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

**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



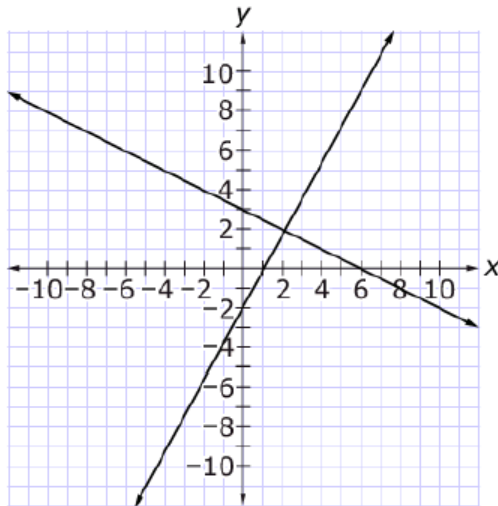
42. Match each recursive function with the equivalent explicit function.

	$f(n)=6^{(n-1)};$ $n \geq 1$	$f(n)=12+6n;$ $n \geq 1$	$f(n)=12^{(n-1)};$ $n \geq 1$	$f(n)=6+12n;$ $n \geq 1$
$f(1)=18;$ $f(n)=f(n-1)+6;$ $n \geq 2$	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
$f(1)=18;$ $f(n)=f(n-1)+12;$ $n \geq 2$	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
$f(1)=1;$ $f(n)=6f(n-1);$ $n \geq 2$	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
$f(1)=1;$ $f(n)=12f(n-1);$ $n \geq 2$	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

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

$$y \geq 2x - 2$$



44. 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.

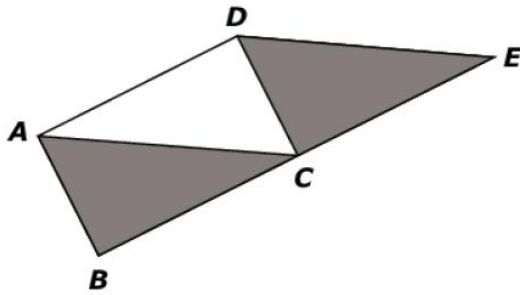
← → ↶ ↷ ✖

1	2	3	y								
4	5	6	+	-	*	÷					
7	8	9	<	≤	=	≥	>				
0	.	-	$\frac{\square}{\square}$	$\square^\square$	$\square_\square$	( )		$\sqrt{\square}$	$\sqrt[\square]{\square}$	$\pi$	i
			sin	cos	tan	arcsin	arccos	arctan			

45. Michael took 12 tests in his math class. His lowest score was 78. His highest test score was 98. On the 13<sup>th</sup> 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
<b>Increased</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Decreased</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Could Not Be Determined</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

46. 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.

47. Choose the domain for which each function is defined.

	All real numbers	$x \neq 0$	$x \neq 4$	$x \neq -4$
$f(x) = \frac{x+4}{x}$	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
$f(x) = \frac{x}{x+4}$	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
$f(x) = x(x+4)$	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
$f(x) = \frac{4}{x^2+8x+16}$	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

48.

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 numbers 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

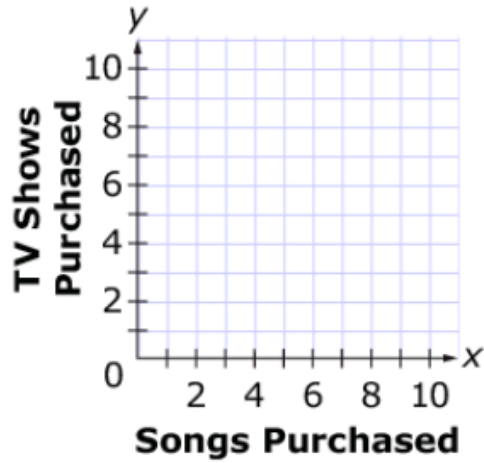
**Part A**

$x$  +   $y$  =

0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10

**Part B**

**Emily's Online Spending**



49.

Given the function  $3x^2 - 12x + 9$

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.

Delete Add Point

