

***EOC Mathematics  
Training Test  
Answer Key***

**Question 1**  
**Algebra 1**

**1**



An expression is shown.

$$a^{\frac{4}{3}} \cdot a^{\frac{2}{3}}$$

What is the product of the two factors?

(A)  $a^{\frac{2}{3}}$

(B)  $a^{\frac{8}{9}}$

(C)  $a^2$

(D)  $a^{\frac{8}{3}}$

Option A is incorrect because one numerator has been subtracted from the other.

Option B is incorrect because the numerators and denominators of the exponents have been multiplied.

Option C is correct because the exponents have been added together.

Option D is incorrect because the numerators of the exponents have been multiplied.

**Question 2**  
**Algebra 2**

2



The product of two numbers is 323 and the difference between them is 2.

What are the two numbers?

Enter each number on a separate line.

17

19

← → ↶ ↷ ✕

1	2	3	+	-	•	÷				
4	5	6	<	≤	=	≥	>			
7	8	9	$\frac{\square}{\square}$	$\square^\square$	$\square_\square$	( )		$\sqrt{\square}$	$\sqrt[\square]{\square}$	$\pi$
0	.	-								

**Other Correct Responses:**

- -17 and -19
- The order of the values may be reversed.

**Question 3**  
**Algebra 2**

**3**   

Scientists are testing 1000 people to determine whether each person has a certain gene.

A *false positive* is a result where the person tests positive,  $T$ , but does not have the gene,  $N$ . The probability of a false positive rate is  $P(T|N)$ .

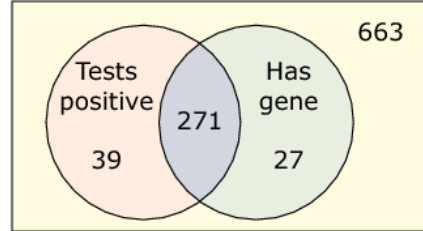
The Venn diagram shows the number of people in the trial who tested positive and the number of people who have the gene.

Drag a number to each box to complete the two-way table.

Then drag a number to each box of the fraction to show the probability of a false positive.

- 39
- 271
- 27
- 663
- 298
- 702
- 310
- 690

 Delete 



	Tests Positive	Tests Negative
Has gene	271	27
Does not have gene	39	663

Probability of false positive =  $\frac{\text{border: 1px dashed black; padding: 2px 5px; display: inline-block; text-align: center;">39}}{\text{border: 1px dashed black; padding: 2px 5px; display: inline-block; text-align: center;">702}}$

**Question 4**  
**Algebra 2**

4



Mrs. Jones surveys her class about their siblings. In the class, 75% of the students have a brother, 82% have a sister, and 65% have both a brother and a sister.

What is the probability that a student has a brother or a sister?

0.92



1	2	3
4	5	6
7	8	9
0	.	-

**Question 5**  
**Geometry**

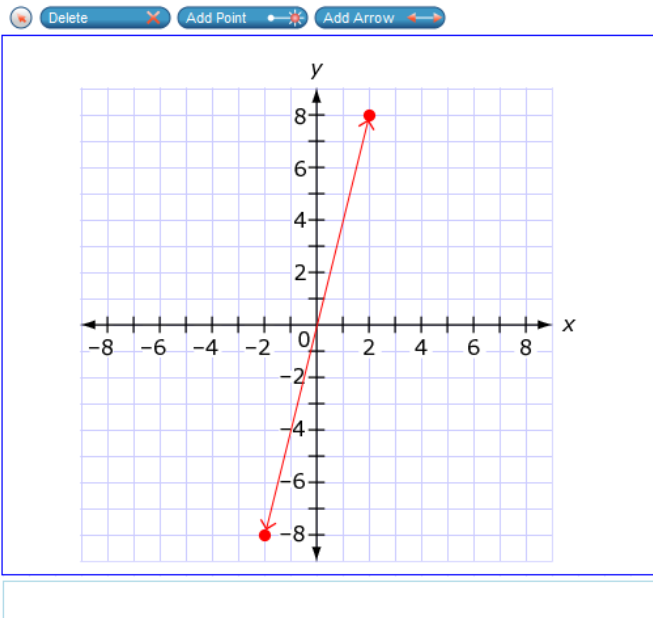
**5**



A linear function is represented in the table shown.

<b>x</b>	<b>y</b>
-1	-6
1	-2
3	2

Use the Add Arrow tool to draw a line on the coordinate grid that has a greater  $y$ -intercept than the function represented by the table and is perpendicular to the function  $y + \frac{1}{4}x = 2$ .



**Other Correct Responses:**

- any line with a slope of 4 and a  $y$ -intercept greater than  $-4$

Question 6  
Geometry

6

The equation of a circle is shown.

$$(x - 3)^2 + (y - 2)^2 = 4$$

The circle is translated 2 units to the right and 4 units up and then is dilated by a factor of 3.

What is the equation of the new circle?

$$(x - 5)^2 + (y - 6)^2 = 36$$

A digital calculator interface with a grid of buttons. The top row contains navigation arrows and a delete button. The second row contains digits 1-3 and variables x and y. The third row contains digits 4-6 and arithmetic operators +, -, •, ÷. The fourth row contains digits 7-9 and comparison operators <, ≤, =, ≥, >. The fifth row contains digits 0, ., -, and mathematical symbols for fraction, square, cube, parentheses, absolute value, square root, nth root, pi, and i. The bottom row contains trigonometric functions: sin, cos, tan, arcsin, arccos, and arctan.

**Other Correct Responses:**

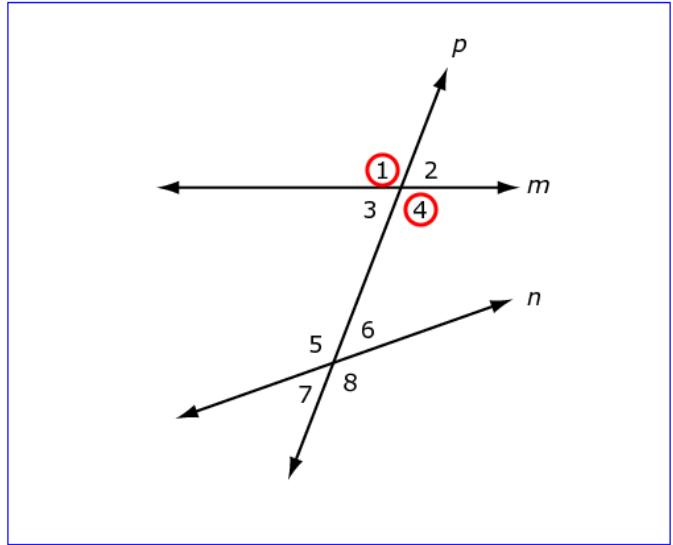
- any equivalent equation

**Question 7**  
**Geometry**

7



Select one pair of vertical angles.



**Other Correct Responses:**

- *angles 2 and 3 selected*
- *angles 5 and 8 selected*
- *angles 6 and 7 selected*



**Question 8**  
**Algebra 1**

8



Consider the equation  $a^b = b$ , where  $a$  and  $b$  are different numbers.

- What is the value of  $a$ ? Enter your answer on the first line.
- What is the value of  $b$ ? Enter your answer on the second line.

0.25

0.5

← → ↶ ↷ ✕

1	2	3
4	5	6
7	8	9
0	.	-

**Other Correct Responses:**

- any pair of values for  $a$  and  $b$  that creates a true equation

**Question 9**  
**Algebra 2****9**

Paul deposits \$1,500 in a savings account every year on the last business day in June. The account earns 5% annual interest, compounded annually (once per year).

Which formula shows  $A$ , the amount of money in the account, in dollars, on the first business day in July, as a result of  $n$  deposits plus interest for  $n \geq 4$ ?

- Ⓐ  $A=1,500[(1.05)^n + (1.05)^{n-1} + (1.05)^{n-2} + \dots + (1.05)^1]$
- Ⓑ  $A=1,500[(1.05)^n + (1.05)^{n-1} + (1.05)^{n-2} + \dots + (1.05)^0]$
- Ⓒ  $A=1,500[(1.05)^{n-1} + (1.05)^{n-2} + (1.05)^{n-3} + \dots + (1.05)^1]$
- Ⓓ  $A=1,500[(1.05)^{n-1} + (1.05)^{n-2} + (1.05)^{n-3} + \dots + (1.05)^0]$

*Option A is incorrect because an extra year of interest has been accounted for and interest on the last deposit has been calculated.*

*Option B is incorrect because an extra year of interest has been accounted for.*

*Option C is incorrect because the interest on the last deposit has been added.*

*Option D is correct because the first deposit accumulates interest for  $n - 1$  years and the last deposit does not earn any interest.*

**Question 10**  
**Geometry**

**10**



A square is inscribed in a circle. The circle has a diameter of  $11\sqrt{2}$ cm.  
What is the length of one side of the square, in centimeters?

11

← → ↶ ↷ ✕

1	2	3	+	-	•	÷				
4	5	6	<	≤	=	≥	>			
7	8	9	$\frac{\square}{\square}$	$\square^{\square}$	$\square^{\square}$	( )		$\sqrt{\square}$	$\sqrt[\square]{\square}$	$\pi$
0	.	-								

**Question 11**  
**Algebra 1**

**11**

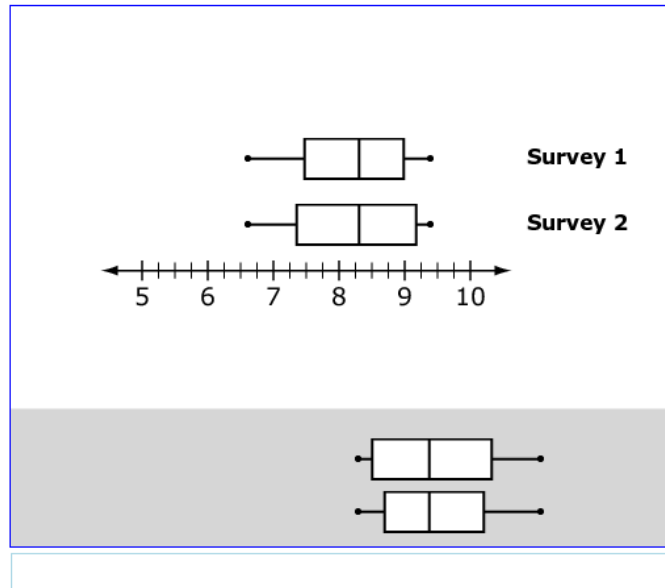


Eddie's Ice Cream conducts two surveys in which people are asked, on a scale of 1 to 10, how much they like the company's products. The results of the surveys are shown.

Survey 1: 9.2, 6.7, 7.3, 7.9,  
9.5, 8.4, 8.1, 8.8, 9.0

Survey 2: 9.4, 6.7, 7.0, 8.1,  
8.4, 9.5, 7.8, 8.6, 9.0

Drag box plots to the number line that represent each survey.



**Question 12**  
**Algebra 2**

**12**

Vanessa and Vinny use two different containers to carry water to a pool.

- Vanessa makes  $A$  trips to the pool, and Vinny makes  $B$  trips to the pool.
- Vanessa's container holds  $x$  gallons of water, and Vinny's container holds  $y$  gallons.

Create an expression that represents the average number of gallons of water carried every trip.

$$\frac{(Ax + By)}{A + B}$$

← → ↶ ↷ ✕

1	2	3	x	y	A	B					
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			

**Other Correct Responses:**

- any equivalent expression

**Question 13**  
**Algebra 2****13**

A contingency table for a class is shown.

**Class Data**

	<b>Juniors</b>	<b>Seniors</b>	<b>Total</b>
<b>Females</b>	6	10	16
<b>Males</b>	9	7	16
<b>Total</b>	15	17	32

What is the probability that a student selected at random is a female given that the student is not a senior?

- A 30%
- B 40%
- C 50%
- D 60%

*Option A is incorrect because this probability approximately relates senior females to the total number of people in the class (10/32).*

*Option B is correct because it equals the number of junior females over the total number of juniors (6/15).*

*Option C is incorrect because this probability relates to the total number of females out of the entire number of people in the class (16/32).*

*Option D is incorrect because this probability approximately relates to the numbers of female seniors over the total number of females in the class.*

**Question 14**  
**Geometry**

**14**



A figure is shown.

Use the Add Arrow tool to draw the line of reflection that carries the shape onto itself.

The workspace shows a grid with a blue border. At the top, there are three tool buttons: 'Delete' (with a red 'X' icon), 'Add Point' (with a red asterisk icon), and 'Add Arrow' (with a red double-headed arrow icon). A black trapezoid is drawn on the grid. A vertical red line with arrows at both ends passes through the center of the trapezoid, representing its line of reflection. The trapezoid is symmetric about this line.

**Question 15**  
**Geometry**

**15**



Use the Add Point tool to plot a point that can be used to form a right triangle with points A and B so that  $\angle ABC$  is the right angle.

Drag C over to this point to label it.

Use the Connect Line tool to draw triangle ABC.

C
Delete
Add Point
Connect Line

**Other Correct Responses:**

- any triangle with a right angle at B and vertices A and C labeled



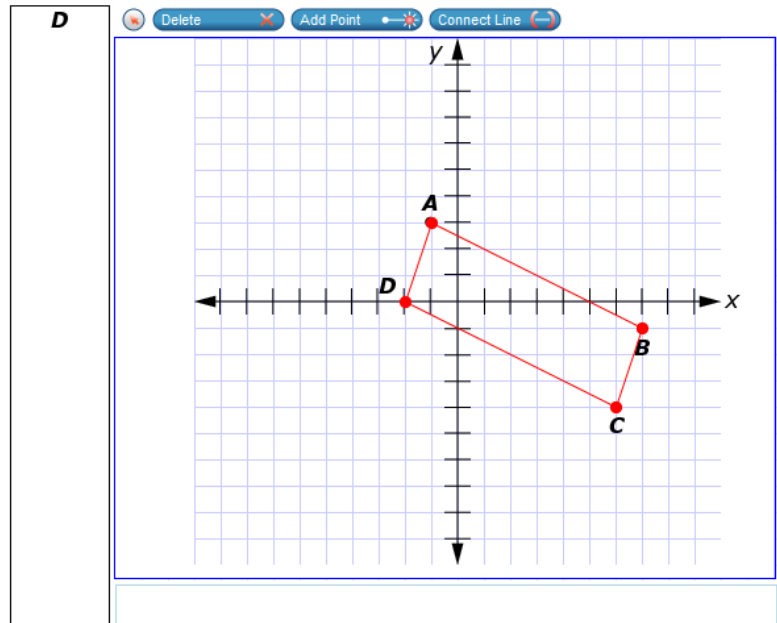
**Question 16**  
**Geometry**

**16**



Quadrilateral  $ABCD$  is a parallelogram. Points  $A$ ,  $B$ , and  $C$  are shown in the answer space.

- Use the Add Point tool to plot vertex  $D$ . Drag  $D$  to the grid to label this vertex.
- Use the Connect Line tool to draw quadrilateral  $ABCD$ .



**Question 17**  
**Algebra 1**

**17**



A line contains the points  $(0, 0)$  and  $(1, 4)$ .

Select all the equations that represent this line.

- $y = x + 4$
- $y = 4x$
- $(y - 0) = 4(x - 0)$
- $x = 4y$
- $x = 0.25y$
- $y = 4x^2$

*The first option is incorrect because the equation does not satisfy both points.*

*The second option is correct because it is the slope-intercept form of the line that contains both points.*

*The third option is correct because it is the point-slope form of the line that contains both points.*

*The fourth option is incorrect because the equation does not satisfy both points.*

*The fifth option is correct because it is an equation for the line in terms of  $x$ .*

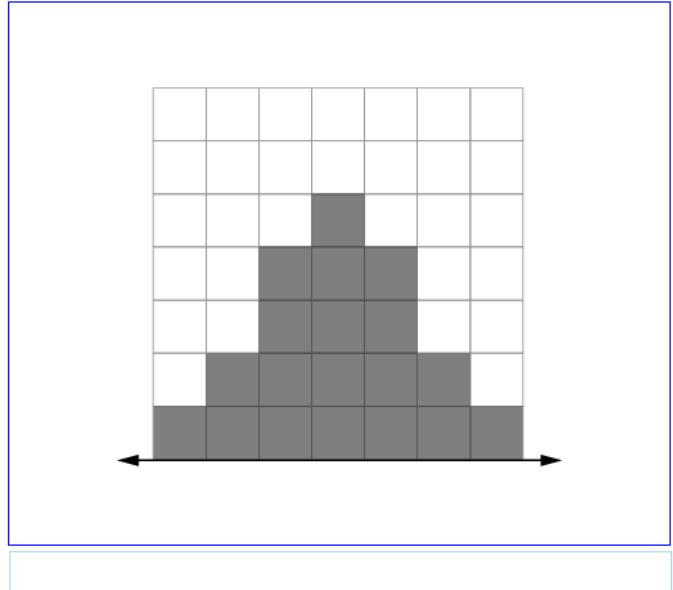
*The sixth option is incorrect because it is a quadratic equation.*

**Question 18**  
**Algebra 2**

**18**



Click on the squares to create a normally distributed histogram.



**Other Correct Responses:**

- *any normally distributed histogram*

**Question 19**  
**Algebra 2**

**19**



The function  $f(x)$  is shown.

$$f(x) = 2x^3 - x^2 + \frac{1}{2}x$$

Let  $g(x) = f\left(\frac{2}{3}x\right)$ .

What is  $g(x)$  in terms of  $x$ ?

$$\frac{16}{27}x^3 - \frac{4}{9}x^2 + \frac{1}{3}x$$

← → ↶ ↷ ✖

1	2	3	x	g(x)							
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			

**Other Correct Responses:**

- any equivalent expression

**Question 20**  
**Algebra 1**

20



Select all the numbers that could be the sum of a rational number and an irrational number.

- 4.076923076923
- 5.236067977567...
- 3.1166666666666̄
- 9.605555127513...
- 6.714285714285
- 2.718281828582...

*The first option is incorrect because it has repeating decimals.*

*The second option is correct because the number does not terminate and there are no repeating decimals.*

*The third option is incorrect because it has repeating decimals.*

*The fourth option is correct because the number does not terminate and there are no repeating decimals.*

*The fifth option is incorrect because it has repeating decimals.*

*The sixth option is correct because the number does not terminate and there are no repeating decimals.*

**Question 21**  
**Algebra 2**

**21**



A function is shown.

$$f(x) = 2x^2 + 3x + 4$$

The function  $g(x)$  is given by  $g(x) = 3 \cdot f(x) + 1$ .

- What is  $g(x)$  in terms of  $x$ ? Enter your answer on the first answer line.
- What is the value of  $g(0)$ ? Enter your answer on the second answer line.

$$g(x) = 6x^2 + 9x + 13$$

13

← → ↶ ↷ ✕

1	2	3	x	g(x)							
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			

**Other Correct Responses:**

- Line 1 may have "g(x)" omitted.
- The terms in line 1 may be in any order.

**Question 22**  
**Algebra 1**

**22**



An equation is shown.

$$a \times b = c$$

Let  $c$  be an irrational number.

What can be said about  $a$  and  $b$ ?

Type your answer in the space provided.

Either  $a$  is an irrational number and  $b$  is a rational number, or,  $a$  is a rational number and  $b$  is an irrational number.