VIRGINIA STANDARDS OF LEARNING

Spring 2009 Released Test

END OF COURSE ALGEBRA I

Form M0119, CORE 1

This released test contains 3 fewer test items (#1-47 only)
than an original SOL EOC Algebra I test.

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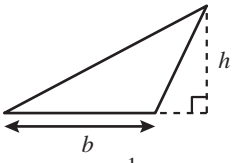
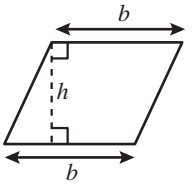
Algebra I Formula Sheet

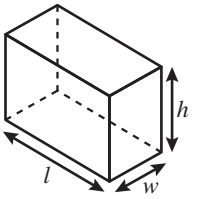
Geometric Formulas



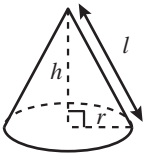
$A = \frac{1}{2}bh$



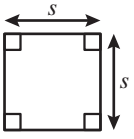
$A = bh$



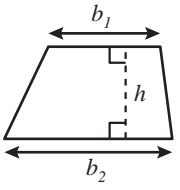
$V = lwh$
$S.A. = 2(lw + lh + wh)$



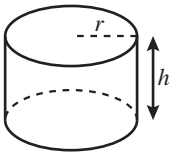
$V = \frac{1}{3}\pi r^2 h$
$S.A. = \pi r(l + r)$



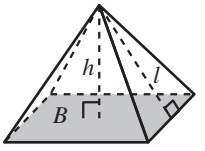
$p = 4s$
$A = s^2$



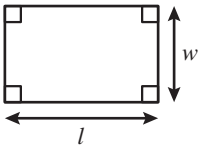
$A = \frac{1}{2}h(b_1 + b_2)$



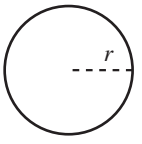
$V = \pi r^2 h$
$S.A. = 2\pi r(h + r)$



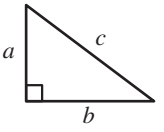
$V = \frac{1}{3}Bh$
$S.A. = \frac{1}{2}lp + B$



$p = 2(l + w)$
$A = lw$



$C = 2\pi r$
$A = \pi r^2$



$c^2 = a^2 + b^2$

Abbreviations

milligram	mg
gram	g
kilogram	kg
milliliter	mL
liter	L
kiloliter	kL
millimeter	mm
centimeter	cm
meter	m
kilometer	km
square centimeter	cm^2
cubic centimeter	cm^3

ounce	oz
pound	lb
quart	qt
gallon	gal.
inch	in.
foot	ft
yard	yd
mile	mi.
square inch	sq in.
square foot	sq ft
cubic inch	cu in.
cubic foot	cu ft

volume	V
total surface area	$S.A.$
area of base	B

year	yr
month	mon
hour	hr
minute	min
second	sec

Pi

$\pi \approx 3.14$

$\pi \approx \frac{22}{7}$

Quadratic Formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Directions

Read each question and choose the best answer. For this test you may assume that the value of the denominator is not zero.

SAMPLE

If $f(x) = x^2 + 2x + 3$, what is the value of $f(x)$ when $x = 6$?

A 27
B 42
C 51
D 60

1 What is the solution to the inequality below?

$$2x - 7 \geq 15$$

A $x \leq 8$
B $x \geq 8$
C $x \leq 11$
D $x \geq 11$

2 Which number is a zero of the function f ?

$$f(x) = x^2 - x - 6$$

F 0
G 2
H 3
J 6

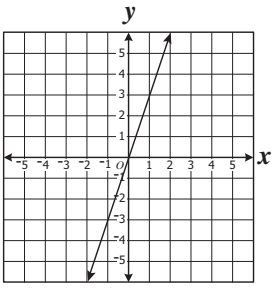
3 If $2n = 6$, what property of equality justifies writing

$$p + 2n = 4p + 15$$

as $p + 6 = 4p + 15$?

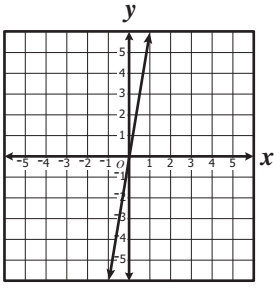
A Addition property
B Transitive property
C Symmetric property
D Substitution property

4 The equation $y = 3x$ is shown on the graph below.

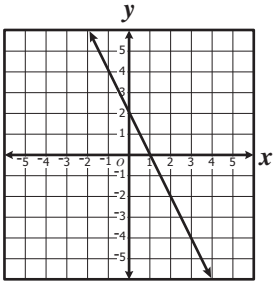


Which is most likely the graph of $y = 3x + 2$?

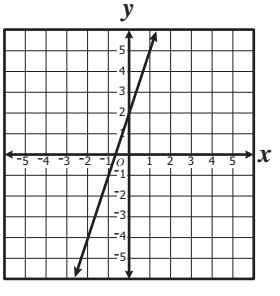
F



G



H



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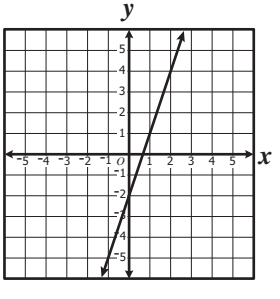


GO ON

5 What is the slope of the line represented by the following equation?

$$y = 2x - 1$$

A -1

B $\frac{1}{2}$

C 1

D 2

6 Kristen heard that it is 82° Fahrenheit outside. She knows that $F = \frac{9}{5}C + 32$, where F represents the temperature in degrees Fahrenheit and C represents the temperature in degrees Celsius. Which is closest to the temperature outside, in degrees Celsius?

F 28

G 63

H 90

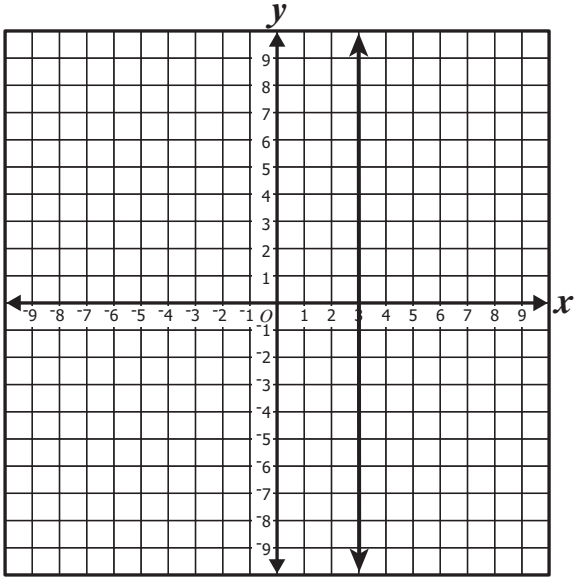
J 180

7 What is the solution to the system of linear equations below?

$$\begin{cases} x + y = 5 \\ x - y = 3 \end{cases}$$

A (8, $^{-}$3)
B (6, $^{-}$1)
C (5, 2)
D (4, 1)

8 Which equation *best* describes the line whose graph is shown?



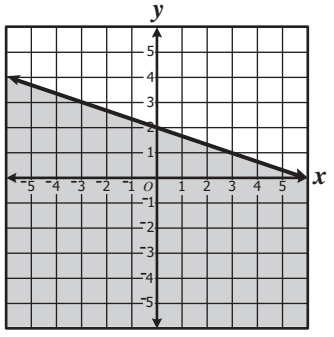
F $y = x + 3$
G $y = 3x$
H $y = 3$
J $x = 3$

GO ON

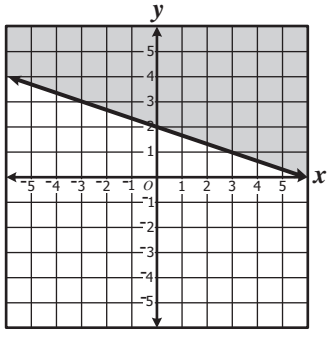
9 Which graph best represents the following inequality?

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

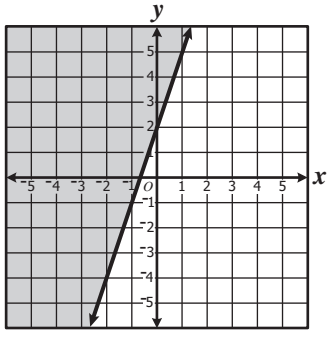
A



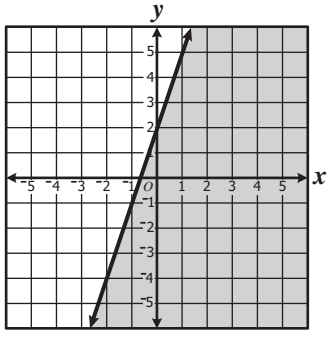
B



C



D



GO ON

10 **Candice plotted the points $(2, 15)$ and $(0, -1)$ and then drew a line through these two points. What is the slope of the line she drew?**

F $\frac{1}{8}$

G $\frac{1}{7}$

H 7

J 8

11 **Which of the following is the solution set to the equation $x^2 - 3x - 28 = 0$?**

A $\{-28, 1\}$

B $\{-4, 7\}$

C $\{-2, 14\}$

D $\{0, 28\}$

12 Ralph spent $132 to buy movie tickets for 20 students and 4 adult chaperones. Adult tickets cost $3 more than student tickets. If A is the price of an adult ticket and S is the price of a student ticket, which system of equations could be used to find the price of each adult and student ticket?

F $\begin{cases} S = A + 3 \\ 4A + 20S = 132 \end{cases}$

G $\begin{cases} A = S + 3 \\ 4A + 20S = 132 \end{cases}$

H $\begin{cases} A + S = 3 \\ 20A + 4S = 132 \end{cases}$

J $\begin{cases} A = S + 3 \\ A + S = 132 \end{cases}$

13 What is the slope of the line represented by the following equation?

$$4x - y + 3 = 0$$

A -1

B $\frac{3}{4}$

C $\frac{4}{3}$

D 4

14 Which is an equation of the line that passes through the points (5, 15) and (10, 20) ?

F $y = x + 10$

G $y = x - 30$

H $y = x + 30$

J $y = x + 15$

15 What is the solution of the system of equations shown?

$$\begin{cases} 2x + 5y = 8 \\ 6x + 4y = {}^{-}20 \end{cases}$$

A $({}^{-}6, 4)$

B $(6, {}^{-}14)$

C $(14, {}^{-}4)$

D $({}^{-}6, {}^{-}4)$

16 What is the solution to the following equation?

$$3(x + 5) - 10 = {}^{-}2(x + 10)$$

F ${}^{-}7$

G ${}^{-}5$

H 1

J 3

17 Which is an equation of a line with a slope of 3 that passes through the origin?

A $x = 3$

B $y = 3$

C $x = 3y$

D $y = 3x$

18 Which of the following equals $3x^2 - 10x - 8$ when factored completely?

F $(3x - 4)(x + 2)$

G $(3x - 1)(x + 8)$

H $(3x + 8)(x - 1)$

J $(3x + 2)(x - 4)$

19 What is $\sqrt{192}$ expressed in *simplest* radical form?

A $8\sqrt{3}$

B $6\sqrt{5}$

C $4\sqrt{12}$

D $2\sqrt{48}$

20 **What is the value of the expression $3(x+4)-2y$, if $x=5$ and $y=-3$?**

F -7

G 11

H 21

J 33

21 **What is the value of the expression $\frac{1}{4}(x^2-y^3)$ when $x=5$ and $y=1$?**

A $\frac{7}{4}$

B $\frac{11}{2}$

C 6

D 31

22 **Which expression is equivalent to $3x^2(4x^2+2x+1)$?**

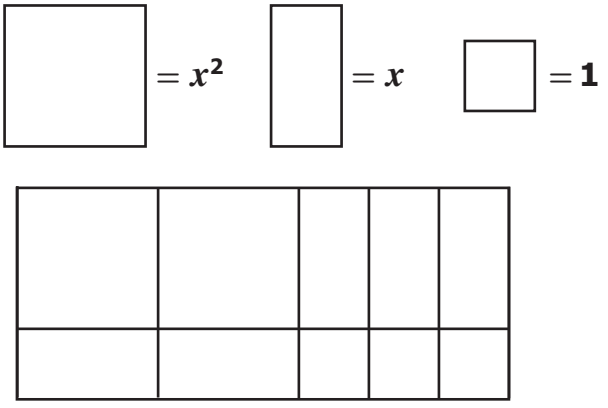
F $7x^2+5x+4$

G $7x^4+5x^3+4x^2$

H $12x^2+6x+3$

J $12x^4+6x^3+3x^2$

23



Based on the models for x^2, x, and 1, which product is represented by the diagram?

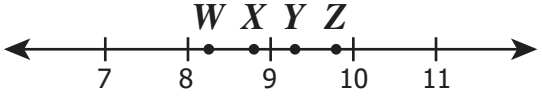
A $(x+1)(x+3)$

B $(2x+3)(x+1)$

C $(2x^2+3)(x+1)$

D $(x^2+x)(2x^2+3x)$

24 **Which labeled point on the number line is closest to the square root of 85 ?**



F W

G X

H Y

J Z

25 Which polynomial is equivalent to the following expression?

$$(3x^2 - 2x + 5) - (2x^2 - 5x + 1)$$

A $x^2 + 3x + 4$
B $x^2 - 7x + 6$
C $x^2 - 3x - 6$
D $x^2 - 7x + 4$

26 Which of the following is equivalent to $\frac{x^4y^3}{x^3y^4}$?

F $\frac{x}{y}$
G $\frac{y}{x}$
H xy
J x^7y^7

27 A factored form of $x^2 + 5x - 24$ is —

A $(x - 4)(x + 6)$
B $(x - 3)(x + 8)$
C $(x - 2)(x + 12)$
D $(x - 6)(x + 4)$

28 Which is equivalent to the following expression?

$$(-2xy)^3$$

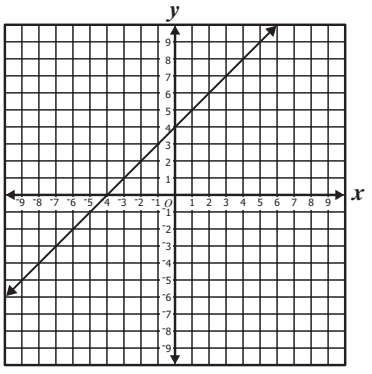
F $-2xy^3$
G $-2x^3y^3$
H $-6x^3y^3$
J $-8x^3y^3$

29 The length of a certain rectangle is six more than three times its width. If the width of the rectangle is 4 units, what is its length?

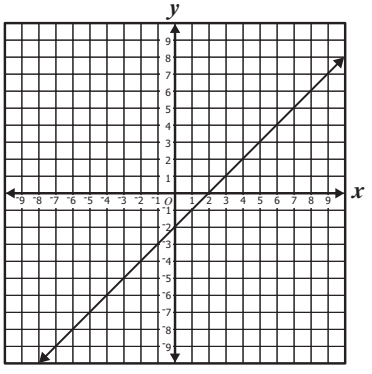
A 10
B 13
C 18
D 27

30 Which of the following graphs shows a direct variation?

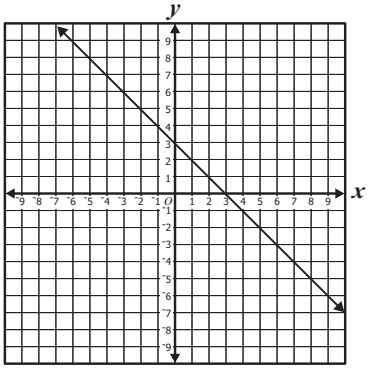
F



G



H



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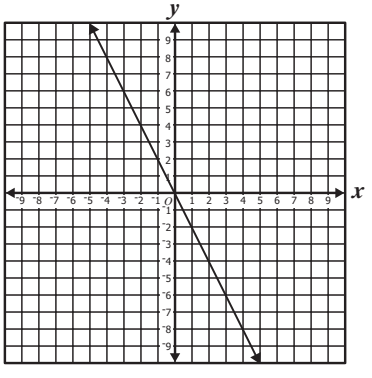
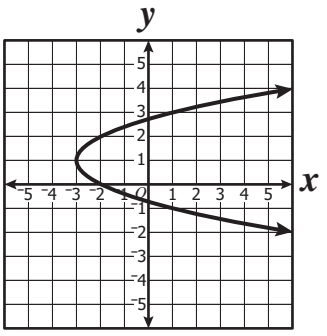
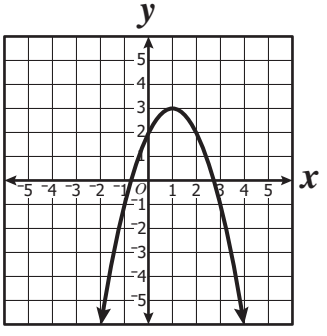


31 Which graph apparently represents a function of x ?

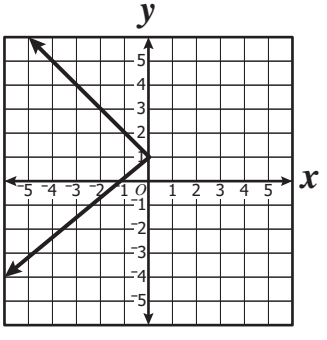
A



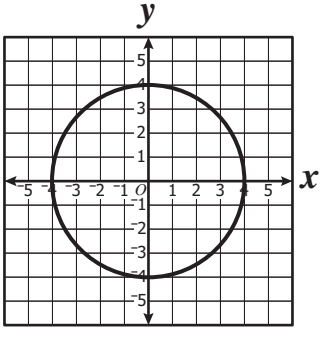
B



C



D



32 If $f(x) = \frac{\sqrt{9-x}}{4}$ what is $f(5)$?

F $\frac{3-\sqrt{5}}{4}$

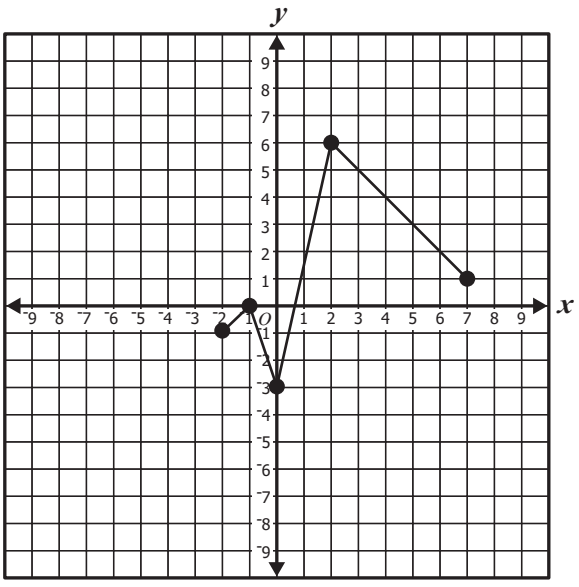
G $\frac{1}{2}$

H $\frac{\sqrt{14}}{4}$

J 1

GO ON

33 What is the range of the function shown?



A $^{-}2 \leq x \leq 7$

B $^{-}3 \leq x \leq 6$

C $^{-}2 \leq y \leq 7$

D $^{-}3 \leq y \leq 6$

34 The table gives the cost for different numbers of 100-sheet notebooks. The cost, C, varies directly as the number of notebooks, n.

Number of notebooks (n)	Cost (C)
2	\$4.30
4	\$8.60
6	\$12.90
8	\$17.20

Which equation represents the relationship shown in the table?

F $C = \frac{2.15}{n}$

G $C = 4.30n$

H $C = 2.15n$

J $C = 2.15 + n$

35 A function of x consists of five ordered pairs of the form (x, y). Four of the ordered pairs are shown below.

$(1, 9),\ (3, 19),\ (5, 29),\ (7, 39)$

Which could be the 5th ordered pair of the function?

A $(9, 8)$
B $(1, 49)$
C $(5, 19)$
D $(3, 9)$

36 **The number of miles, m, a car can travel varies directly with the amount of gas, g, in its fuel tank. If k is the constant of variation, which equation represents that situation?**

F $m = \frac{k}{g}$

G $m = \frac{g}{k}$

H $m = kg$

J $m = g + k$

37 **The function $f(x) = 1{,}200 - 50x$ gives the distance left to travel after driving x hours. What is $f(9)$, the distance left to travel after driving 9 hours?**

A 450 miles

B 691 miles

C 750 miles

D 850 miles

38 **Which is a zero of the function defined by the following equation?**

$$f(x) = x(x + 2)$$

F $^{-}2$

G $^{-}1$

H 1

J 2

39 The relationship shown in the table is a direct variation.

x	y
5	15
6	18
7	21
8	24

Which equation *best* represents this relationship?

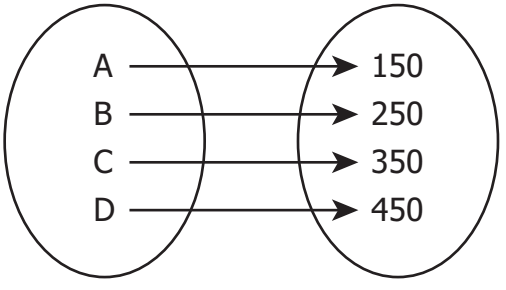
A $y = 4x - 5$

B $y = x + 10$

C $y = 3x$

D $y = \frac{1}{3}x$

40 Which of the following represents the domain of the relation shown?



F {A, B, C, D}

G {A, B, 150, 250}

H {150, 250, 350, 450}

J {A, 150, B, 250, C, 350, D, 450}

41 Christy and Claire take piano lessons. Their practice times for the past week are shown in the matrix.

	M	W	F	Sa
Christy	20	10	15	20
Claire	0	5	15	30

Which matrix could represent the new practice schedule if their teacher wants them to practice twice as much this week?

A $\begin{bmatrix} 10 & 5 & 7.5 & 10 \\ 0 & 2.5 & 7.5 & 15 \end{bmatrix}$

B $\begin{bmatrix} 40 & 20 & 30 & 40 \\ 0 & 5 & 15 & 30 \end{bmatrix}$

C $\begin{bmatrix} 40 & 20 & 30 & 40 \\ 0 & 10 & 30 & 60 \end{bmatrix}$

D $\begin{bmatrix} 22 & 12 & 17 & 22 \\ 2 & 7 & 17 & 32 \end{bmatrix}$

42 $\begin{bmatrix} 1 & 7 \\ 6 & 3 \end{bmatrix} - \begin{bmatrix} 4 & -8 \\ 2 & -1 \end{bmatrix} =$

F $\begin{bmatrix} 3 & 15 \\ -4 & 4 \end{bmatrix}$

G $\begin{bmatrix} -3 & 15 \\ 4 & 4 \end{bmatrix}$

H $\begin{bmatrix} -4 & 56 \\ -12 & 3 \end{bmatrix}$

J $\begin{bmatrix} -3 & -1 \\ 4 & 2 \end{bmatrix}$

43 This table shows the wind chill at 40°F for various wind speeds.

Wind Speed (miles per hour), s	5	10	15	20	25	30	40	50	60
Wind Chill (°F), t	36	34	32	30	29	28	27	26	25

Which equation most closely represents a line of best fit for the data?

A $t = -0.2s + 35$

B $t = 0.2s - 35$

C $t = -35s + 0.2$

D $t = 35s - 0.2$

44 **Which matrix is equivalent to** $3\begin{bmatrix} 6 \\ -3 \\ -9 \end{bmatrix}$**?**

F $\begin{bmatrix} 2 \\ -1 \\ -3 \end{bmatrix}$

G $\begin{bmatrix} 18 \\ -3 \\ -9 \end{bmatrix}$

H $\begin{bmatrix} 18 \\ -9 \\ -27 \end{bmatrix}$

J $\begin{bmatrix} 6 \\ -9 \\ -9 \end{bmatrix}$

45 The chart below shows the scores for each of the first 10 basketball games for the Hawks and the Blue Jays.

Hawks	Blue Jays
95	91
93	103
93	93
93	76
82	91
81	95
80	90
103	104
87	95
98	95

Which of the following is true?

A The mode for the Hawks is less than the mode for the Blue Jays.

B The mean for the Blue Jays is less than the mean for the Hawks.

C The median for the Hawks is greater than the median for the Blue Jays.

D The range for the Hawks is greater than the range for the Blue Jays.

46 **Easy Street Deli serves sandwiches with 3 choices of bread and 3 choices of meat. The tables show the number of each type of sandwich sold on Monday and Tuesday.**

Monday

	White Bread	Wheat Bread	Rye Bread
Ham	41	55	43
Roast Beef	29	56	21
Turkey	50	30	28

Tuesday

	White Bread	Wheat Bread	Rye Bread
Ham	56	70	34
Roast Beef	67	54	40
Turkey	50	32	29

Which matrix shows the difference between the number of different sandwiches sold on Tuesday and the number sold on Monday?

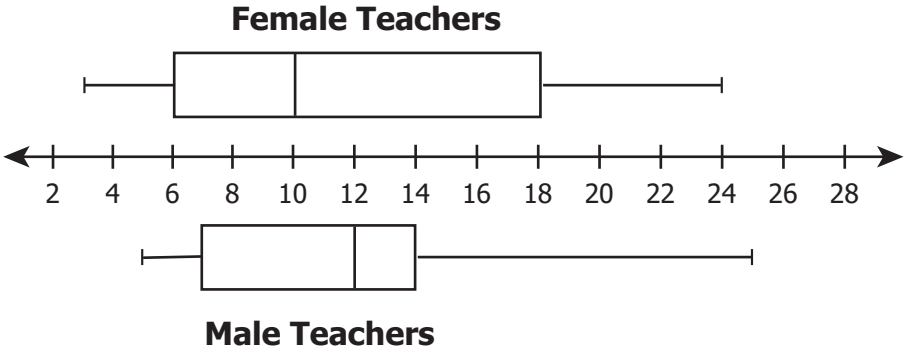
F $\begin{bmatrix} 21 \\ 55 \\ 3 \end{bmatrix}$

G $\begin{bmatrix} 15 & 15 & -9 \\ 38 & -2 & 19 \\ 0 & 2 & 1 \end{bmatrix}$

H $\begin{bmatrix} 97 & 125 & 77 \\ 96 & 110 & 61 \\ 100 & 62 & 57 \end{bmatrix}$

J $\begin{bmatrix} 15 & 15 & 9 \\ 38 & 2 & 19 \\ 0 & 2 & 1 \end{bmatrix}$

47 The male and female teachers at Mountainview School recorded the number of years they have been teaching at the school. The box-and-whisker plots summarize the data.



Which statement is *false*?

A The teacher with the least number of years teaching is female.

B The range in the years teaching is greater for male teachers than for female teachers.

C The difference in the maximum number of years teaching for male and female teachers is 1.

D The median number of years teaching for female teachers is 2 less than the median for male teachers.

STOP