MATHEMATICS

$7^{th}/8^{th}$ ALGEBRA I

BENCHMARK TEST

Third Testing Period
March 3-7, 2003

Grades 9, 10, and 11 Exit Level
Mathematics Chart

LENGTH

Metric	Customary
1 kilometer = 1000 meters	1 mile = 1760 yards
1 meter = 100 centimeters	1 mile = 5280 feet
1 centimeter = 10 millimeters	1 yard = 3 feet
	1 foot = 12 inches

CAPACITY AND VOLUME

Metric	Customary
1 liter = 1000 milliliters	1 gallon = 4 quarts
	1 gallon = 128 ounces
	1 quart = 2 pints
	1 pint = 2 cups
	1 cup = 8 ounces

MASS AND WEIGHT

Metric	Customary
1 kilogram = 1000 grams	1 ton = 2000 pounds
1 gram = 1000 milligrams	1 pound = 16 ounces

TIME

1 year = 365 days
1 year = 12 months
1 year = 52 weeks
1 week = 7 days
1 day = 24 hours
1 hour = 60 minutes
1 minute = 60 seconds

Grades 9, 10, and 11 Exit Level Mathematics Chart

Perimeter	rectangle	$P = 2l + 2w$ or $P = 2(l + w)$
Circumference	circle	$C = 2\pi r$ or $C = \pi d$
Area	rectangle	$A = lw$ or $A = bh$
	triangle	$A = \frac{1}{2}bh$ or $A = \frac{bh}{2}$
	trapezoid	$A = \frac{1}{2}(b_1 + b_2)h$ or $A = \frac{(b_1 + b_2)h}{2}$
	circle	$A = \pi r^2$
Surface Area	cube	$S = 6s^2$
	cylinder (lateral)	$S = 2\pi rh$
	cylinder (total)	$S = 2\pi rh + 2\pi r^2$ or $S = 2\pi r(h + r)$
	cone (lateral)	$S = \pi rl$
	cone (total)	$S = \pi rl + \pi r^2$ or $S = \pi r(l + r)$
	sphere	$S = 4\pi r^2$
Volume	prism or cylinder	$V = Bh$*
	pyramid or cone	$V = \frac{1}{3}Bh$*
	sphere	$V = \frac{4}{3}\pi r^3$
**B represents the area of the Base of a solid figure.*		
Pi	π	$\pi \approx 3.14$ or $\pi \approx \frac{22}{7}$
Pythagorean Theorem		$a^2 + b^2 = c^2$
Distance Formula		$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
Slope of a Line		$m = \frac{y_2 - y_1}{x_2 - x_1}$
Midpoint Formula		$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$
Quadratic Formula		$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
Slope-Intercept Form of an Equation		$y = mx + b$
Point-Slope Form of an Equation		$y - y_1 = m(x - x_1)$
Standard Form of an Equation		$Ax + By = C$
Simple Interest Formula		$I = prt$

Direction: Read each question. Then fill in the correct answer on your answer document.

1. The table shows a set of values for x and y.

x	-2	-1	1	3	4
y	-7	-4	2	8	11

Which equation best represents this set of Data?

(A) $y = x - 5$
(B) $y = x + 3$
(C) $y = 3x - 1$
(D) $y = -x - 5$
(E) $y = -3x + 1$

2. The area of a triangle is given by the equation

$$h^2 - 6h = 72$$

where h is the height of the triangle. What is the value of h?

(A) 6
(B) 8
(C) 9
(D) 12
(E) 24

3. The equation of 2 lines are shown below.

$$2x - 4y = 6$$
$$3x + y = -5$$

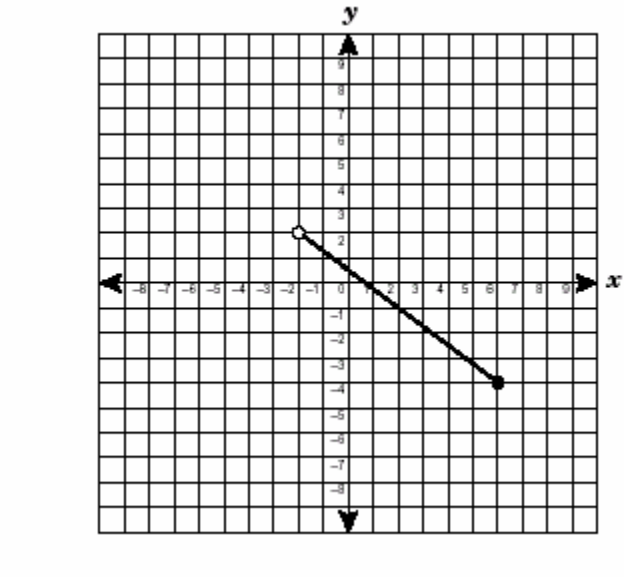
What are the coordinates of the point of Intersection?

(A) (-1, -8)
(B) (-3, -3)
(C) (-1, -1)
(D) (1, 1)
(E) (-1, -2)

4. At which points does the graph of $f(x) = x^2 + 3x - 18$ intersect the x-axis?

(A) (-9, 0) and (2, 0)
(B) (-6, 0) and (-3, 0)
(C) (-6, 0) and (3, 0)
(D) (-3, 0) and (6, 0)
(E) (-2, 0) and (9, 0)

5. What is the domain of the function shown on the graph?



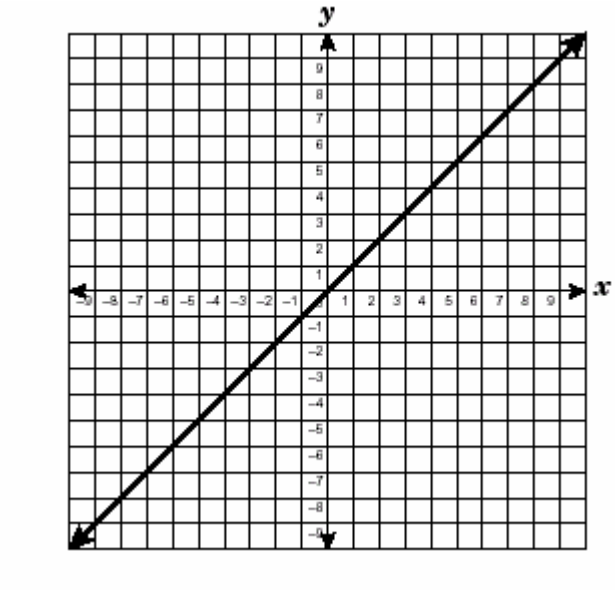
(A) $-2 < y \leq 2$
(B) $-4 \leq x \leq 6$
(C) $-4 < y \leq 2$
(D) $-2 < x \leq 6$
(E) $-2 \leq x \leq 2$

6. What is the value of x in the following equation?

$$3x - 4(x + 1) + 10 = 0$$

(A) 2
(B) 6
(C) 10
(D) 11
(E) 14

7. Which function is best represented by the graph below?



(A) $y = \frac{1}{2}x - 1$
(B) $y = -x$
(C) $y = x^2$
(D) $y = x$
(E) $y = \frac{1}{2}x + 1$

8. The circumference of a circular rug is about 31.4 feet, and its area is about 78.5 square feet.
What is the approximate radius of the rug?

(A) 3.5 ft
(B) 5 ft
(C) 7 ft
(D) 9 ft
(E) 10 ft

9. Tanya keeps a record of her weekly earning. Last week she worked a total of 6 hours and Earned $51. This week she worked a total of 9 hours and earned $76.50. Which equation can be used to find *f(x)*, the amount she would earn at this rate if she worked *x* hours?

(A) $f(x) = \frac{2}{17}x$
(B) $f(x) = \frac{2}{3}x$
(C) $f(x) = 1.5x$
(D) $f(x) = 8.5x$
(E) $f(x) = 12.75x$

10. Eduardo's bowling scores for his first 3 games were 145, 136, 156. If he wants to have an average score of *x* after 4 games, which equation describes *s*, the score he needs for his fourth game?

(A) $x = \frac{145+136+156}{s}$
(B) $x = \frac{145+136+156}{3} + s$
(C) $x = \frac{145+136+156+s}{4}$
(D) $x = \frac{145+136+156+s}{3}$
(E) $x = \frac{145+136+156}{4} + s$

11. Which equation represents the line that passes through the points (6, 1) and (-2, -3)?

(A) $y = -\frac{1}{2}x + 4$
(B) $y = \frac{1}{2}x + 2$
(C) $y = \frac{1}{2}x - 2$
(D) $y = 2x - 1$
(E) $y = 2x - 11$

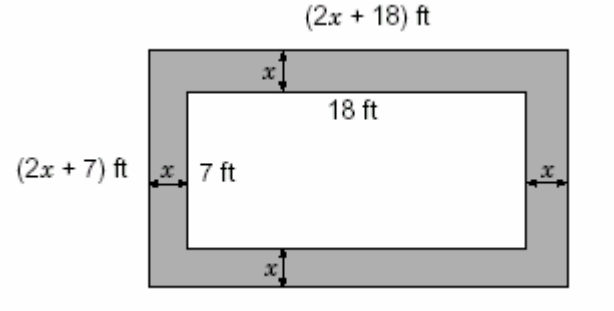
12. To convert a temperature in degrees Fahrenheit, *F*, to temperature in degrees Celsius, *C*, the following formula can be used.

$$C = \frac{5}{9}(F - 32)$$

What is the minimum value of *F* that will make *C* greater than or equal to 70?

(A) 68.4
(B) 94
(C) 126
(D) 158
(E) 183.6

13. Mrs. Mora wants to put a sidewalk around a rectangular garden. The garden is 7 feet wide and 18 feet long. The sidewalk will be the same width all the way around the garden.



The area of the sidewalk will be 150 square Feet. What will be the sidewalk's width, x?

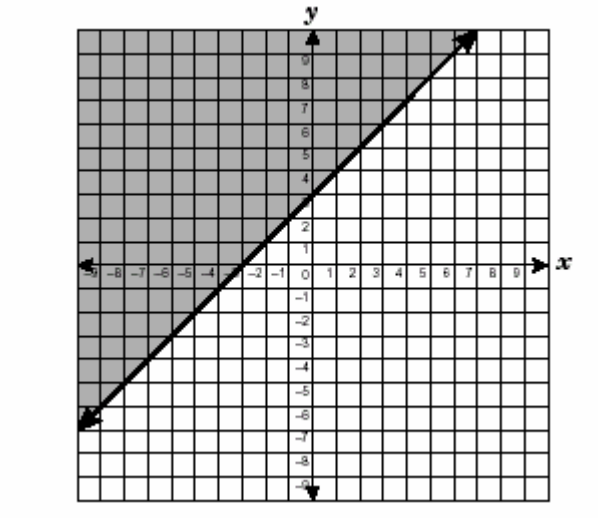
(A) 2.5 ft
(B) 3.5 ft
(C) 5 ft
(D) 5.5 ft
(E) Not Here

14. Wayne cut a 60-inch wire into 3 pieces. The longest piece was twice as long as Each of the other 2 pieces, which were the same length. What was the length of the longest piece of wire?

Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

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

15. Which inequality best describes the graph below?

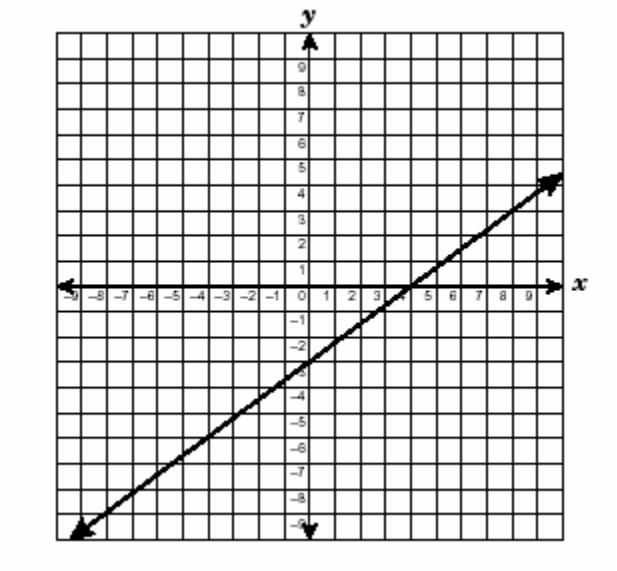


(A) $x - y \le 3$
(B) $x + y \le -3$
(C) $x + y \ge -3$
(D) $x - y \ge 3$
(E) $x - y \le -3$

16. Mohammed earns $650 per month plus 8% commission on his sales. If he sold x dollars of merchandise last month, which equation can be used to find y, his total earnings last month?

(A) $y = x + 0.08x$
(B) $y = (650 + 0.08)x$
(C) $y = 0.08(650 + x)$
(D) $y = 650 + .08x$
(E) $y = 0.08(650) + x$

17. What is the x-intercept of the function graphed below?



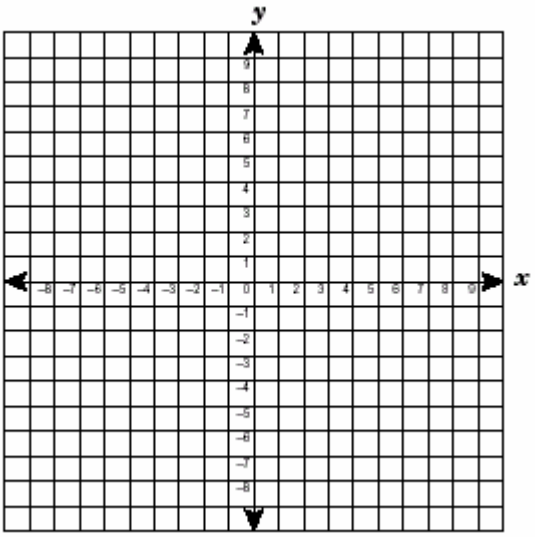
(A) -4
(B) 4
(C) 6
(D) -6
(E) 0

18. What is the y-intercept of the function

$$2x + 3y = -36$$

(A) -12
(B) 12
(C) -18
(D) 18
(E) 9

19. The graph of line p has x-intercept (-3, 0) and y-intercept of (0, -6). The graph of line q has a slope of 1 and crosses the origin.



Which coordinate pair names the point at which lines p and q intersect?

(A) (0, -2)
(B) (-2, 0)
(C) (-2, -2)
(D) (-3, 0)
(E) (-6, 0)

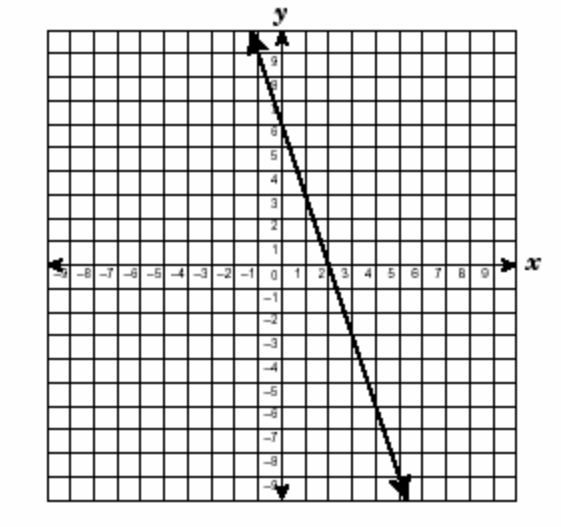
20. The area of a rectangular floor is described by the equation

$$w(w - 9) = 252$$

where w is the width of the floor in meters. What is the width of the floor?

(A) 12 m
(B) 14 m
(C) 16 m
(D) 21 m
(E) 28 m

21. The graph of the function $y = -3x + 6$ is shown below.



If the line is translated 3 units down, which Function will describe the new line?

(A) $y = -3x + 3$
(B) $y = -x + 2$
(C) $y = -3x - 1$
(D) $y = -x + 6$
(E) $y = -3x - 3$

22. Ms. Nugent has saved $325 for a new refrigerator. She plans to save an additional $50 per month. What is the least number of months she will need to save money in order to have enough to buy a refrigerator that costs $760?

Record your answer and fill in the Bubbles on your answer document. Be sure to use the correct place value.

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

23. The owner of a convenience store recorded the number of customers in the store from 6:00 a.m. to 11:00 a.m. who were served coffee and the number of pots of coffee that were consumed.

Number of Pots of Coffee, p	Number of Customers, c
2	16
3	24
4	32
5	40
7	56

Which equation best describes the relationship between the number of customers who were served coffee and the number of pots of coffee?

(A) $c = 5p + 5$
(B) $c = 8p$
(C) $c = 6p + 3$
(D) $c = 6p$
(E) $c = 12p - 9$

24. Yesterday a total of 24 students were present in Alfred's class. There were 3 fewer girls than twice the number of boys. Which system of equations can be used to find g, the number of girls who were present in Alfred's class yesterday, and b, the number of boys who were present?

(A) $g + b = 24$
$g = 2b - 3$

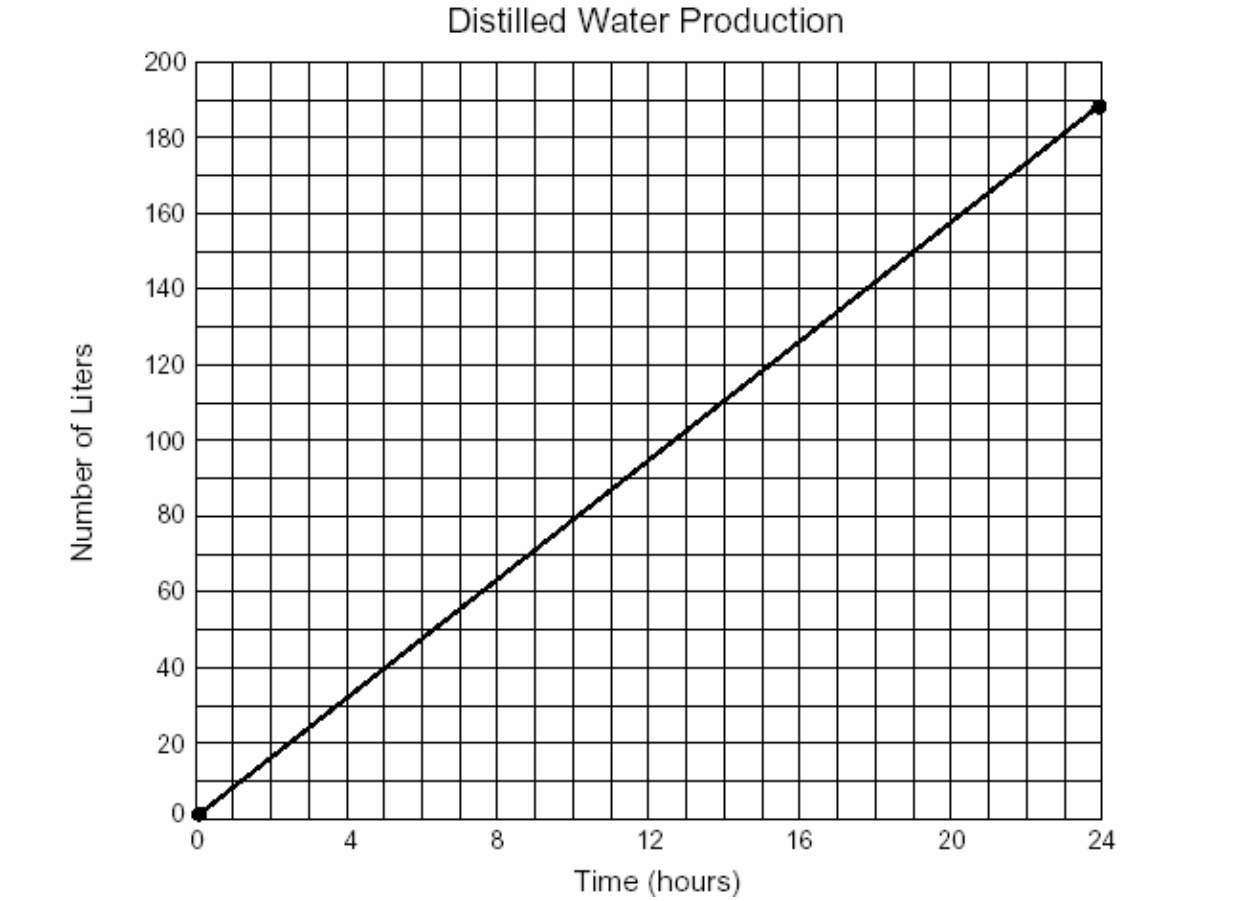
(B) $g + b = 24$
$b = 2g - 3$

(C) $g + b = 24$
$g = 2b + 3$

(D) $g + b = 24$
$b = 2g + 3$

(E) $g = b + 24$
$b = 2g - 3$

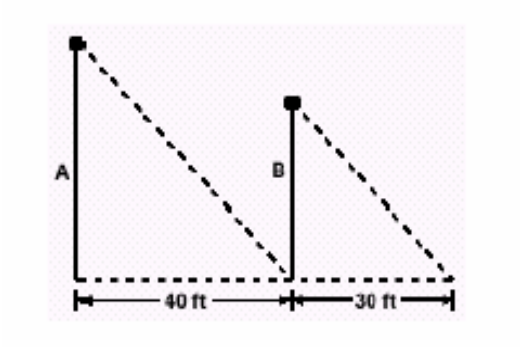
25. A water distillation machine can produce 189 liters of water during each day of continuous operation. The graph shows the rate at which the machine produces water.



If the machine operates continuously for 3000 hours, what will be the total number of Liters of distilled water produced?

(A) 11,907 L
(B) 23,625 L
(C) 47,250 L
(D) 70,875 L
(E) 72,000 L

26. The diagram below shows two flagpoles, A and B.



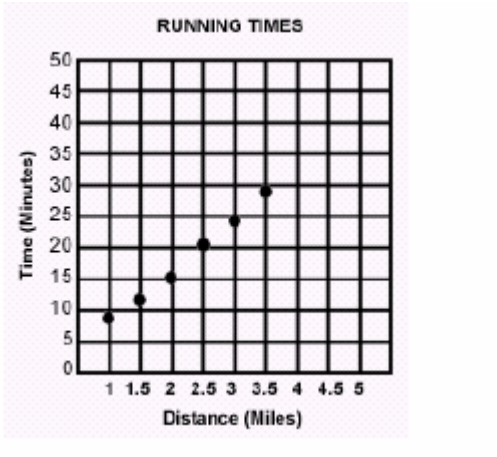
If flagpole A is 50 ft. tall, how tall is flagpole B?

(A) 35 ft
(B) 37.5 ft
(C) 40 ft
(D) 42.5 ft

27. A model of a theme park is built at a scale of 1 cm = 100 meters. On the model, the distance between the Klondike roller coaster and the Roaring Rapids River Ride is 24.25 cm. What is the actual distance between the Klondike and the Roaring Rapids.

(A) 2.425 meters
(B) 242.5 meters
(C) 2,425.0 meters
(D) 2,524.0 meters

28. Maria is on the cross-country running team and has been timing herself as she runs different distances. The data she collected are shown in the scatterpot below.



Based on the data in the scatterplot, how Long will it take Maria to run 5 miles?

(A) Between 33 and 36 minutes
(B) Between 36 and 39 minutes
(C) Between 39 and 42 minutes
(D) Between 45 and 48 minutes

29. What is the value of $(8 \bullet 5) \div (x - 1)$ when $x = 5$?

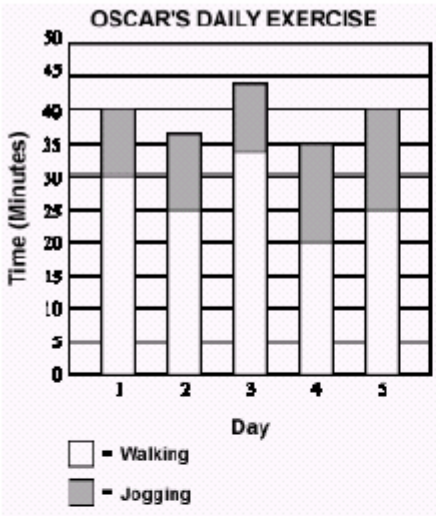
(A) 15
(B) 45
(C) 65
(D) 10

30. Oscar is trying to get in shape. Each day he does combination of jogging and walking, and he is keeping track of how much time spends doing each activity. The table below shows his records.

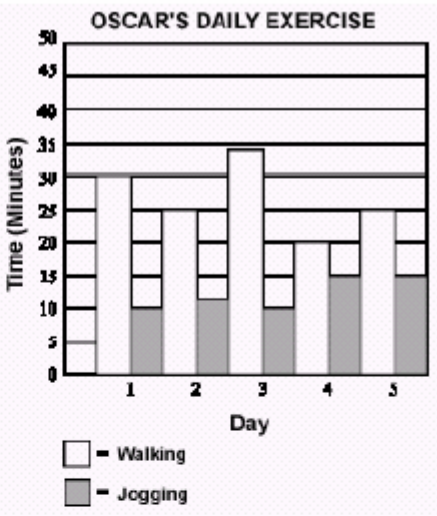
Day	Minutes Walking	Minutes Jogging
1	30	10
2	25	12
3	34	10
4	20	15
5	25	15

Which bar graph best represents the data in the table?

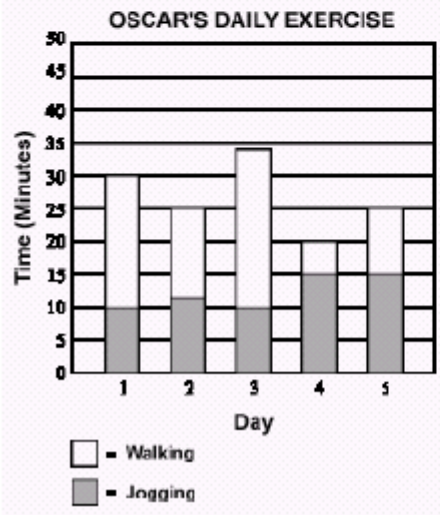
(A)



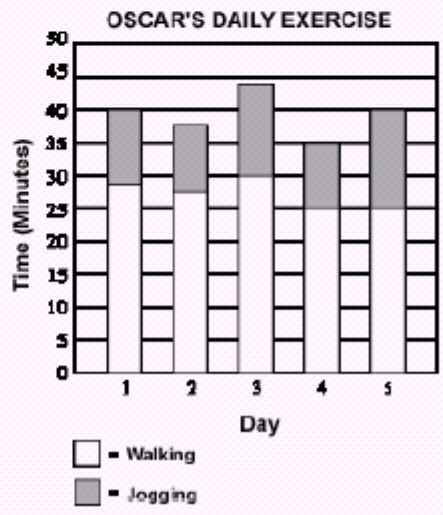
(B)



(C)



(D)



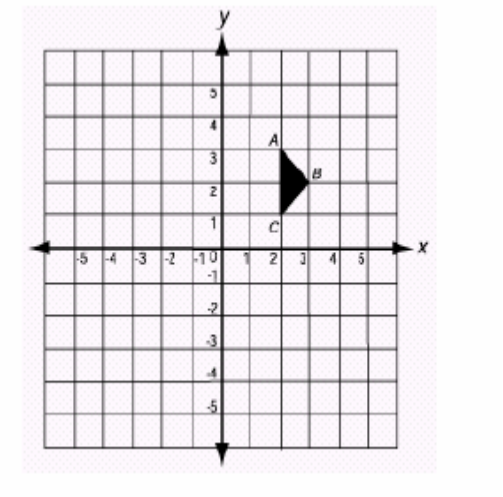
31. The cafeteria workers at Albert Middle School keep track of how many peanut butter and jelly sandwiches and how many tuna fish sandwiches are sold at lunch each day. They find that they usually sell many more peanut butter and jelly sandwiches, so they conclude that more people at Albert Middle School prefer peanut butter and jelly than prefer tuna fish. Which is the best explanation for why their conclusion might NOT be correct?

(A) The sales might be different if they offered more types of sandwiches.
(B) They should have actually spoken to the students buying the sandwiches.
(C) They did not take the teachers and other employees of the school into account.
(D) They did not take into account the students who bring their lunches to school.

32. Mr. Mendez bought a house for $150,000. He put 10% of the money down as a deposit. A bank gave him a loan for the rest of the money. Which equation can be used to find *M*, the amount of the bank loan?

(A) $M = \$150{,}000 \div 0.10$
(B) $M = \$150{,}000 + 15{,}000$
(C) $M = \$150{,}000 + (0.10 \times \$150{,}000)$
(D) $M = \$150{,}000 - (0.10 \times \$150{,}000)$

33. Triangle ABC is reflected along line AC. At what point is Point B now located?



(A) (3, 2)
(B) (-3, -2)
(C) (0, 3)
(D) (1, 2)

34. Earl earns between $8 and $10 per hour for mowing lawns. What is a reasonable estimate of the number of hours it will take him to earn $300.00

(A) 40 hours
(B) 33 hours
(C) 25 hours
(D) 18 hours

END OF EXAMINATION