



Common Core Benchmark Pre-Test

1. The table shows the approximate number of Earth hours there are in one day for two of the planets. Which is the same amount of time as 4 Venus days and 6 Neptune days?

Planet	Length of Day (Earth Hours)
Venus	3^5
Neptune	2^4

- (A) 1,036 Earth hours
 (B) 1,068 Earth hours
 (C) 1,522 Earth hours
 (D) 1,554 Earth hours
2. Which expression is equivalent to $8x^2y \cdot 8yz^2$?

- (A) $64x^2y^2z^2$
 (B) $64x^2yz^2$
 (C) $16x^2y^2z^2$
 (D) $384x^2y^2z^2$

3. What is the product of eight factors of 10^4 ?

- (A) 80^{32}
 (B) 80^4
 (C) 10^{32}
 (D) 10^{12}

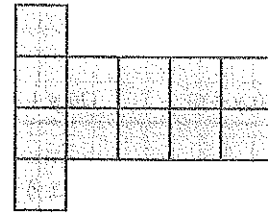
4. On a number line, point X is at 3^{-3} , and point Y is at 3^{-2} . Which of the following is between point X and point Y?

- (A) 2^{-5} (C) 5^{-2}
 (B) 4^{-1} (D) 6^{-1}

5. A music Web site announced that over 4×10^9 songs were downloaded by 5×10^7 registered users. What is the average number of downloads per user?

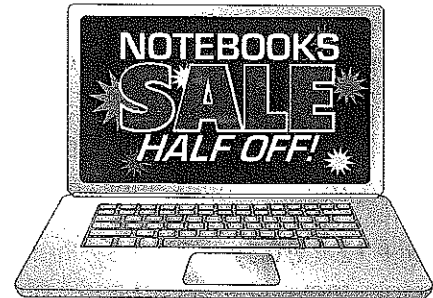
- (A) 8×10^{-1}
 (B) 1.25×10^{-2}
 (C) 1.25×10^2
 (D) 8×10

6. The figure below is composed of squares. Its area is 300 square centimeters. What is the perimeter of the figure?



- (A) 25 cm (C) 192 cm
 (B) 90 cm (D) 240 cm

7. A store is having a sale on notebook computers. Which equation can be used to find the regular price x of a notebook computer that is on sale for \$799?

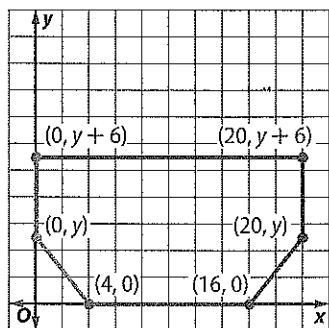


- (A) $799x = 0.5$ (C) $\frac{1}{799}x = 0.5$
 (B) $0.5x = 799$ (D) $\frac{1}{0.5}x = 799$

8. The lowest temperature ever recorded in Texas is -31° Celsius. Celsius ($^\circ\text{C}$) and Rankine ($^\circ\text{R}$) temperatures are related by the formula $C = \frac{5}{9}R - 273$. To the nearest whole number, what is the Rankine equivalent of -31°C ?

- (A) 48°R (C) 436°R
 (B) 134°R (D) 547°R

9. An engineer drew a cross-sectional view of a concrete highway support. The area of the cross-section is 200 square yards. What is the value of y ?



- (A) 5 (C) 20
 (B) 11 (D) 88

10. Twelve more than $2x$ is x and $\frac{1}{2}y$ is two and one-half more than $3y$. Which shows the representative equations and the directions to plot a point with the resulting coordinate values?

- (A) $2x + 12 = x$; $0.5y = 2.5 + 3y$; From the origin, move 12 units right and 1 unit up.
 (B) $2x + 12 = x$; $0.5y = 2.5 + 3y$; From the origin, move 12 units left and 1 unit down.
 (C) $x + 12 = 2x$; $0.5y + 2.5 = 3y$; From the origin, move 12 units right and 1 unit up.
 (D) $x + 12 = 2x$; $0.5y + 2.5 = 3y$; From the origin, move 12 units left and 1 unit down.

11. What is the ratio of Jaime's hours worked to Mai's hours worked if the total hours worked for all employees is $7m + 19$?

Employee	Hours Worked
Shantel	48
Lorenzo	$2m + 7$
Jaime	$3.5(m - 6)$
Mai	m

- (A) 80 (C) 2.8
 (B) 30 (D) 0.375

12. The slope of a line is $-\frac{2}{3}$. One point on the line has coordinates $(4, 3)$. Which ordered pair represents another point on the line?

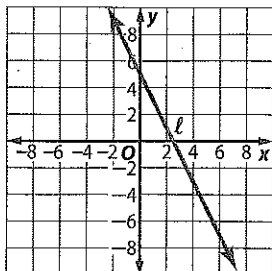
- (A) $(10, 7)$
 (B) $(10, -1)$
 (C) $(0, 9)$
 (D) $(8, 9)$

13. The table shown below shows the number of pizzas ordered from a local pizza shop and the total cost in dollars. The cost includes a \$2 delivery fee. Next week, the shop is going to decrease the price of a pizza by \$1.50. Which equation represents the new relationship?

Number of Pizzas	Total Cost (\$)
1	13
2	24
3	35
4	46

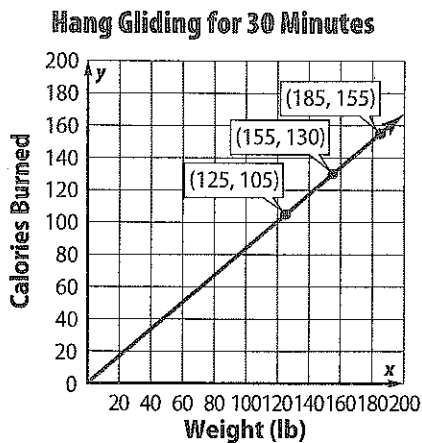
- (A) $y = 9.50x + 2$
 (B) $y = 9.50x$
 (C) $y = 12.50x + 2$
 (D) $y = 12.50x$

14. Line ℓ is graphed below. Line m has the same y -intercept as line ℓ , but half the slope of ℓ . What is the x -intercept of line m ?



- (A) 1
- (B) 2
- (C) 4
- (D) 5

15. The graph shows the Calories burned in 30 minutes of hang gliding for various weights. Which equation represents the relationship shown in the graph?



- (A) $y = \frac{5}{6}x - \frac{5}{6}$
- (B) $y = \frac{5}{6}x + \frac{5}{6}$
- (C) $y = \frac{6}{5}x - \frac{6}{5}$
- (D) $y = \frac{6}{5}x + \frac{6}{5}$

16. Leanne has three times as many points as Jay. Jay has 20 fewer points than Leanne. Which system of equations can be used to find each player's points?

- (A) $j = 3l$
 $j = l + 20$
- (B) $j = 3l$
 $j = l - 20$
- (C) $l = 3j$
 $l = j + 20$
- (D) $l = 3j$
 $l = j - 20$

17. The pressure in pounds per square feet changes as an object is submerged into water. Use the information in the table below. What would be an estimate of the pressure on an object submerged to a depth of 20 feet?

Depth (ft)	Pressure (lb/ft ²)
0	2,117
4	2,367
8	2,617
10	2,742

- (A) 11,835 lb/ft²
- (B) 7,601 lb/ft²
- (C) 5,484 lb/ft²
- (D) 3,367 lb/ft²

18. Malinda is buying CDs that cost \$12.99 each. There is a shipping charge of \$4.95 added to the total cost of the CDs. Which function represents the total cost $C(m)$ of buying m CDs?

- (A) $C(m) = m(12.99 + 4.95)$
- (B) $C(m) = 4.95m + 12.99$
- (C) $C(m) = 12.99m + 4.95$
- (D) $C(m) = (12.99 - 4.99)m$



19. Which statement is true about the relations in the tables?

Table 1	
x	y
-4	-4
1	2
5	5

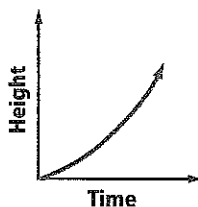
Table 2	
x	y
-1	1
3	5
5	7

- (A) Neither table represents a linear function.
- (B) Only Table 1 represents a linear function.
- (C) Only Table 2 represents a linear function.
- (D) Both tables represent linear functions.

20. Which equation represents a nonlinear function?

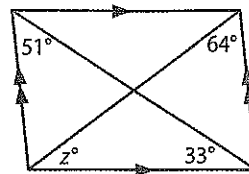
- (A) $y = 3x + 9$
- (B) $y = 9$
- (C) $x = -2$
- (D) $xy = -3$

21. The graph represents the height of a plant as it grows. Which statement is true?



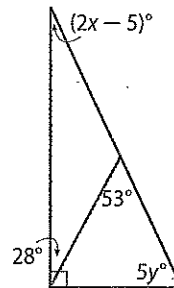
- (A) The graph is decreasing.
- (B) The graph is increasing.
- (C) The graph remains constant.
- (D) The graph is linear.

22. What is the value of z in the figure below?



- (A) 32
- (B) 51
- (C) 64
- (D) 116

23. What are the values of x and y in the figure below?



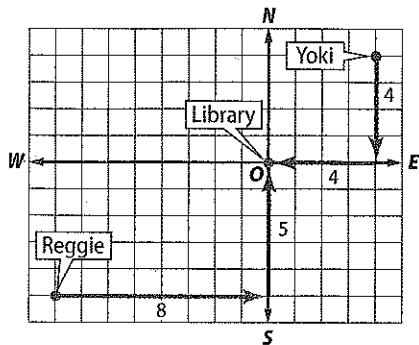
- (A) $x = 25, y = 65$
- (B) $x = 65, y = 25$
- (C) $x = 15, y = 13$
- (D) $x = 13, y = 15$

24. A stained-glass window is in the shape of a regular hexagon. What is the measure in degrees of one interior angle of the window?

- (A) 1,080
- (B) 720
- (C) 180
- (D) 120

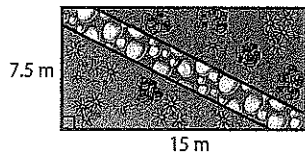


25. Reggie and Yoki are riding their bikes to meet at the library, as shown in the drawing. Yoki started from his house and rode 4 miles south and 4 miles west. Reggie started from his house and rode 8 miles east and 5 miles north.



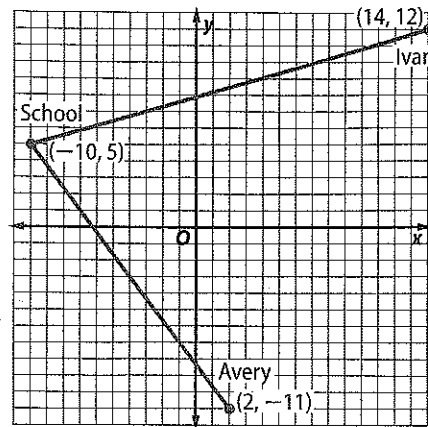
To the nearest mile, what is the *straight-line* distance that Reggie lives from Yoki?

- (A) 6
 - (B) 9
 - (C) 15
 - (D) 225
26. Ms. Jimenez designed a rectangular garden. She plans to build a walkway through the garden as shown. Which measure is the closest to the length of the walkway?



- (A) 8 m
- (B) 11 m
- (C) 17 m
- (D) 23 m

27. The map shows the locations of Ivan's house, Avery's house, and their school. Each unit on the map represents 0.25 mile.



How many more miles does Ivan live from school than Avery?

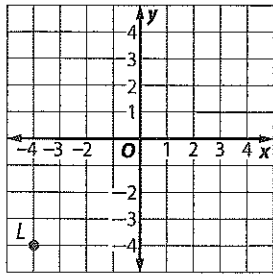
- (A) 1.25
 - (B) 5
 - (C) 20
 - (D) 25
28. Parallelogram $PQRS$ is translated to parallelogram $P'Q'R'S'$. Which algebraic representation describes the translation?

Vertices of $PQRS$	Vertices of $P'Q'R'S'$
$P(-4, -4)$	$P'(-1, -5)$
$Q(-3, -1)$	$Q'(0, -2)$
$R(-1, -1)$	$R'(2, -2)$
$S(-2, -4)$	$S'(1, -5)$

- (A) $(x, y) \rightarrow (x + 3, y - 1)$
- (B) $(x, y) \rightarrow (x - 3, y + 1)$
- (C) $(x, y) \rightarrow (x + 1, y - 3)$
- (D) $(x, y) \rightarrow (x - 1, y + 3)$

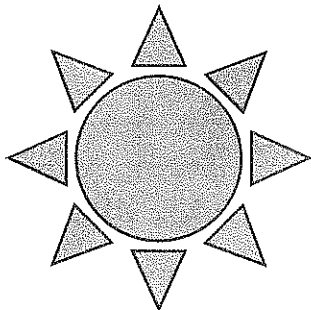


29. Quadrilateral $LMNP$ is reflected over the y -axis to form quadrilateral $L'M'N'P'$. Quadrilateral $L'M'N'P'$ is then translated 1 unit right and 1 unit down to form quadrilateral $L''M''N''P''$. If point L is $(-4, -4)$, what are the coordinates of point L'' ?



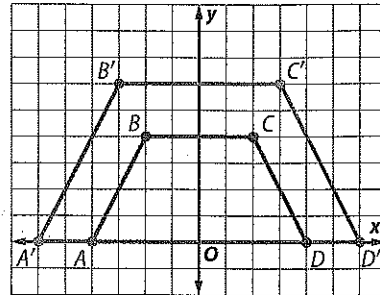
- (A) $(4, -4)$
- (B) $(5, -5)$
- (C) $(-3, -5)$
- (D) $(-3, 3)$

30. Kendra made a sun with rotational symmetry out of mosaic tiles as shown below. She then placed the sun on a coordinate plane so that the center of the sun was the origin. What is the smallest angle of clockwise rotation in degrees that the sun can be rotated about the origin and match the original orientation of Kendra's sun?



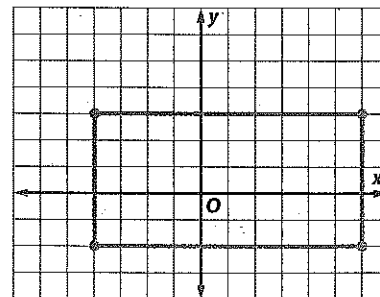
- (A) 180
- (B) 90
- (C) 45
- (D) 8

31. Fina is an architect. She drew quadrilateral $ABCD$ to represent a window. Then, using the origin as the center, she dilated it to obtain the larger quadrilateral $A'B'C'D'$. Which statement is true?



- (A) $m\angle A' = 1.5 \times m\angle A$
- (B) $m\angle A' = 2.25 \times m\angle A$
- (C) area of $A'B'C'D' = 1.5 \times$ area of $ABCD$
- (D) area of $A'B'C'D' = 2.25 \times$ area of $ABCD$

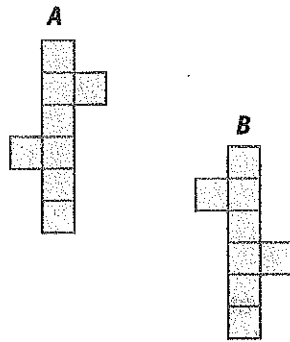
32. The rectangle below is dilated, increasing both dimensions by 20%. Then that image is dilated, decreasing both dimensions by 20%. The perimeter of the final image, P'' , is related to the original perimeter P by the equation $P'' = x \cdot P$. What is the value of x ?



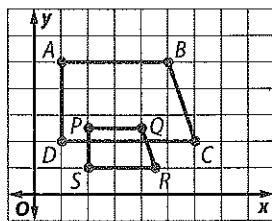
- (A) 0.04
- (B) 0.64
- (C) 0.96
- (D) 1



33. Serena arranged floor tiles to make pattern *A* and pattern *B*. Are Serena's two designs congruent? If so, describe the transformation(s) that map pattern *A* to pattern *B*.

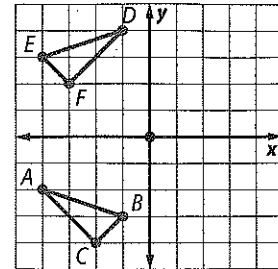


- (A) The two designs are not congruent.
- (B) Design *A* is translated to make design *B*.
- (C) Design *A* is translated and rotated to make design *B*.
- (D) Design *A* is reflected and translated to make design *B*.
34. Trapezoid *ABCD* is similar to trapezoid *PQRS*. Which series of transformations maps point *C* onto point *R*?

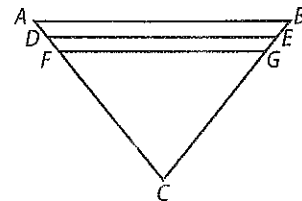


- (A) rotation then a dilation
- (B) reflection then a dilation
- (C) translation then a dilation
- (D) two dilations

35. Refer to $\triangle DEF$ and $\triangle ABC$ below. How can $\triangle DEF$ be transformed to show it is congruent to $\triangle ABC$?



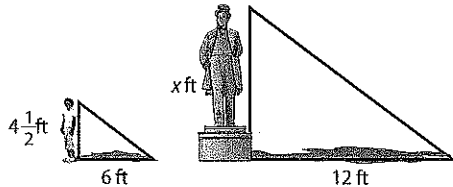
- (A) reflection over the *y*-axis followed by a translation 5 left and 6 down
- (B) reflection over the *x*-axis followed by a translation 5 left and 6 up
- (C) rotation 270° counterclockwise about the origin
- (D) rotation 270° clockwise about the origin
36. Triangle *ABC* is shrunk to obtain triangle *DEC*. Using the same scale factor, triangle *DEC* is shrunk to obtain triangle *FGC*. If $AB = 50$ centimeters, $BC = 40$ centimeters, $CA = 40$ centimeters, and $DE = 45$ centimeters, what is the perimeter of triangle *FGC*?



- (A) 87.2 cm
- (B) 100 cm
- (C) 105.3 cm
- (D) 117 cm



37. Mila must determine the height of the statue to make a scale drawing of it. Mila is $4\frac{1}{2}$ feet tall, and her shadow is 6 feet long. At the same time, the statue's shadow is 12 feet long. What is the height of the statue?



- (A) $8\frac{1}{4}$ ft
 (B) 9 ft
 (C) $13\frac{1}{2}$ ft
 (D) 24 ft
38. Triangles RST and UVW are slope triangles for line m . The coordinates of the vertices are shown below. What is the slope of line m ?

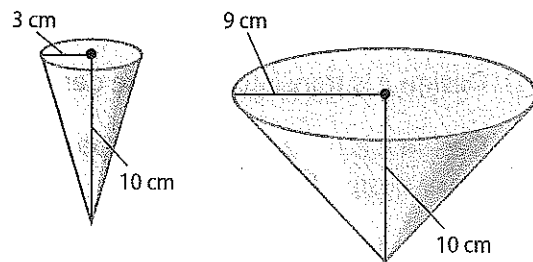
	R	S	T	U	V	W
x	-3	-1	-1	1	2	2
y	-10	-10	-4	2	2	5

- (A) undefined
 (B) 0
 (C) $\frac{1}{3}$
 (D) 3
39. Two pieces of wood are in the shape of similar rectangles. The ratio of the perimeters of the two pieces is 2:3. If the area of the smaller piece is 12 square inches, what is the area of the larger piece?
- (A) 8 in^2 (C) 27 in^2
 (B) 18 in^2 (D) 36 in^2

40. A circular pool has a diameter of 20 feet and is 4 feet deep. It is being filled with water at a rate of 20 gallons per minute. A cubic foot is about 7.5 gallons. About how many hours will it take to fill the pool?

- (A) 167
 (B) 56
 (C) 8
 (D) 3

41. What is the ratio of the volume of the smaller cone to the larger cone?



- (A) 1:3 (C) 3:1
 (B) 1:9 (D) 9:1

42. Brad is packing 3 balls in a cylindrical container. The radius of each ball is 10 centimeters. The cylinder has a base area of 314 square centimeters and a height of 65 centimeters. What is the volume of empty space in the container rounded to the nearest whole number?

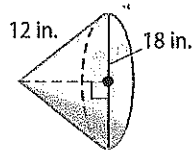
- (A) $4,189 \text{ cm}^3$
 (B) $7,843 \text{ cm}^3$
 (C) $12,566 \text{ cm}^3$
 (D) $20,410 \text{ cm}^3$



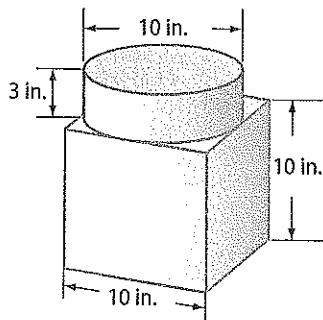
43. Jordan is painting three cylinders and needs to determine how much paint to buy. To the nearest whole number, what is the total surface area of the three cylinders?

Cylinder	Diameter (cm)	Height (cm)
A	6	5
B	4	2
C	12	3

- (A) 274 cm^2 (C) 644 cm^2
 (B) 540 cm^2 (D) $2,713 \text{ cm}^2$
44. The dimensions of the cone below are doubled. What is the surface area of the larger cone?



- (A) $4,750.4 \text{ in}^2$ (C) $1,187.6 \text{ in}^2$
 (B) $2,375.2 \text{ in}^2$ (D) 593.8 in^2
45. Carlos makes geometrical artworks out of sheet metal. The dimensions of a full-size sculpture will be 6 times the dimensions of the model shown below. He will not use any metal for the bottom base of the cylinder. How many square feet of sheet metal will Carlos use for the full-size sculpture?



- (A) 172.8 ft^2 (C) 772.8 ft^2
 (B) 193.2 ft^2 (D) $27,820.8 \text{ ft}^2$

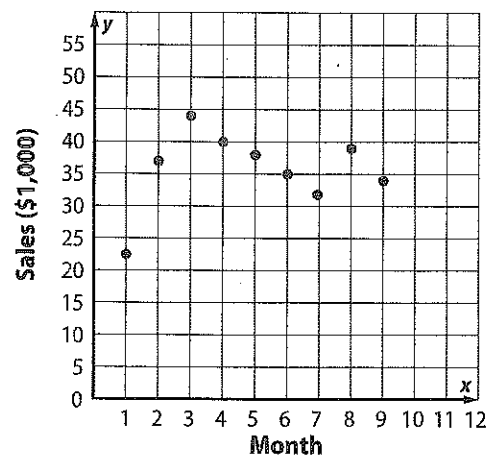
46. The tables below show the average monthly temperatures in degrees Fahrenheit for a certain city for one year, with January representing month 1 and December representing month 12. Which describes the association among the data?

Month	1	2	3	4	5	6
$^{\circ}\text{F}$	31	37	39	49	60	74

Month	7	8	9	10	11	12
$^{\circ}\text{F}$	78	80	73	58	50	35

- (A) negative linear association
 (B) positive linear association
 (C) nonlinear association
 (D) no association
47. The scatter plot below shows hybrid car sales, in thousands of dollars, for the first 9 months of a certain year. What is the best estimate of hybrid sales in Month 11?

Hybrid Sales



- (A) \$25,000 (C) \$45,000
 (B) \$35,000 (D) \$55,000

48. The two-way table shows the number of hours students studied and whether they studied independently or with a study group. What is the relative frequency of students that studied independently for more than 2 hours to the total number of students that studied independently?

	Less Than 2 Hours	More Than 2 Hours
Studied Independently	12	4
Studied with a Study Group	8	11

- (A) 0.25 (C) 0.37
 (B) 0.33 (D) 0.40
49. The high temperatures for five days are shown below.
 60°F, 62°F, 58°F, 70°F, 65°F
 What is the mean absolute deviation?

- (A) 63°F (C) 18.0°F
 (B) 23°F (D) 3.6°F

50. A student council surveyed every 5th student out of 315 students about their preferences for the new school mascot. The table shows the survey results.

Mascot	Tiger	Owl	Wolf
Votes	21	18	24

Which statement best represents the survey results?

- (A) About 75 students want a tiger.
 (B) About 105 students want a tiger.
 (C) No valid prediction is possible because the sample is biased.
 (D) The sample is unbiased, but there is not enough information for a valid prediction.