Port Angeles School District
Geometry Benchmark Test Proposal for 2009-2010

Number Properties and Operations

Select the best answer.

1. The total value of outstanding stock in the stock market is 5.87 trillion dollars. What is this value in scientific notation?
   A 587×10^9
   B 587×10^9
   C 58.7×10^9
   D 5.87×10^{11}
   E 5.87×10^{12}

2. Which number sentence could be used to determine the number of minutes, m in d days?
   A $m = d(24 \cdot 60)$
   B $m = d(24 \cdot 60 \cdot 60)$
   C $m = d(24 + 60 + 60)w$
   D $m = d(24 \cdot 52)$
   E $m = d(12 \cdot 24 \cdot 60 \cdot 60)$

3. Which statement is *false*?
   A $-16.566 > -18.378$
   B $13^3 > 24^2$
   C $|-26^2| = |27^2 - 53|$
   D $-1\frac{3}{5} > -1\frac{3}{4}$
   E $5 \times 4^2 < 9 \times 2^3$

4. Which value is the largest?
   A 0.197
   B 0.5
   C 0.489
   D 0.2348
   E 0.178

5. Evaluate the expression:
   $4^2 \div (10 - 9 + 1)^3 \cdot 3 - 5$
   A -16
   B 1
   C 15
   D 19
   E 26

6. Estimate the product 27.468×39.569 by rounding to the nearest one.
   A 1070
   B 1080
   C 1082
   D 1087
   E 1090

7. Find the area of this figure to the nearest whole number.

   A 33 m^2
   B 64 m^2
   C 252 m^2
   D 260 m^2
   E 306 m^2

8. Reginald went to the gym to work out exactly 13 times a month for 4 years in a row. How many times did he go to the gym during this time period?
   A 24 times
   B 52 times
   C 312 times
   D 624 times
   E 780 times

9. The ball bin had 14 soccer balls, 18 baseballs, 22 basketballs and 20 playground balls. What was the ratio of soccer balls to total number of balls in the bin?
   A 14 to 52
   B 14:79
   C 7:27
   D 7 to 37
   E 7:39

10. At the soccer stadium, 4 megaphones costs $38.25. Which proportion could be used to find the cost of 9 megaphones?

A $\frac{\$38.25}{4} = \frac{9}{x}$

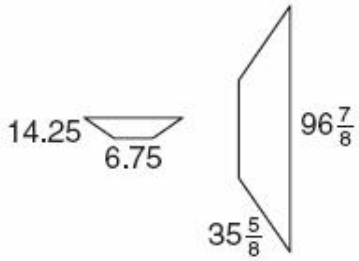
B $\frac{\$38.25}{4} = \frac{x}{9}$

C $\frac{\$38.25}{x} = \frac{9}{4}$

D $\frac{\$38.25}{4} = \frac{x}{13}$

E $\frac{\$38.25}{13} = \frac{x}{9}$

11. What is the scale factor, in simplest form, for the two similar isosceles trapezoids shown below?



A 14.25 to $35\frac{5}{8}$

B 2 to 5

C 6.75 to 14.25

D 8 to 7

E 9 to 8

12. An engine is rated at 160 horsepower, but only delivers 110 horsepower. What is the percent of efficiency?

A 14.6%

B 34.6%

C 68.8%

D 77.6%

E 145.5%

13. What is 67.5% of 610?

A 188.54

B 198.28

C 205.88

D 411.75

E 422.50

14. The number 17 is a factor of all of these numbers *except:*

A 85

B 119

C 221

D 272

E 359

15. What is the least common multiple of 27, 90, and 84?

A 3

B 9

C 1260

D 1890

E 3780

16. Sara purchases 6 kitchen faucets for $164 each. If the sales tax rate is 7.25%, what is the total amount Sara is charged?

A $876.21

B $984.00

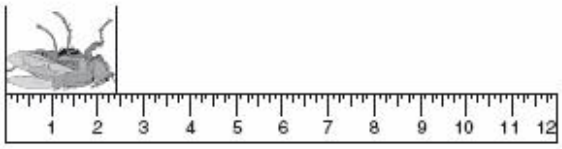
C $1055.34

D $1476.07

E $1502.36

Measurement

17. What is the length of three horseflies if one horsefly measures what is shown below?



A $2\frac{3}{8}$ inches

B 6.375 inches

C 6.875 inches

D $7\frac{1}{8}$ inches

E $7\frac{1}{2}$ inches

18. What is the approximate area of a circle with a diameter of 8 inches?

A 12.56 square inches

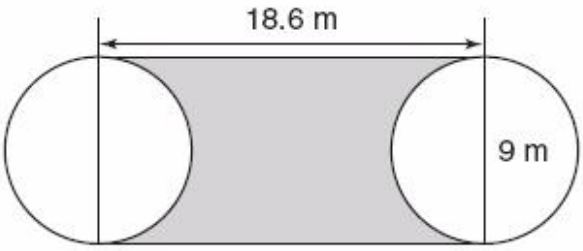
B 25.12 square inches

C 50.24 square inches

D 100.48 square inches

E 200.96 square inches

Use the figure below to answer Questions 19 and 20.



19. What is the perimeter of the shaded area?

A 27.6 m

B 55.2 m

C 63.12 m

D 65.46 m

E 167.4 m

20. What is the area of the shaded region? (Use 3.14 for π.)

A 103.815 m^2

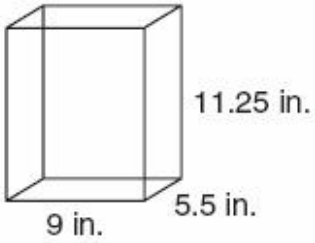
B 325.9791 m^2

C 525.636 m^2

D 669.625 m^2

E 705.345 m^2

21. What is the surface area of the prism?



A 111.4 square inches

B 154.5 square inches

C 222.8 square inches

D 324.0 square inches

E 425.25 square inches

22. The length of a rectangular air filter is 4 feet more than twice the width. Find the length of the air filter if the area is 240 square feet.

A 12 feet

B 16 feet

C 20 feet

D 24 feet

E 25 feet

23. Babe bikes 6.2 miles in 42 minutes. What is her rate in miles per hour?

A 8.86 mph

B 6.77 mph

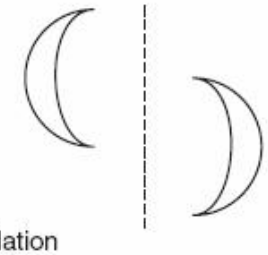
C 6.20 mph

D 0.15 mph

E 0.11 mph

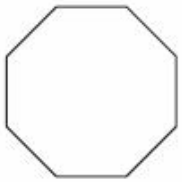
Geometry

24. Which type of transformation is shown below?



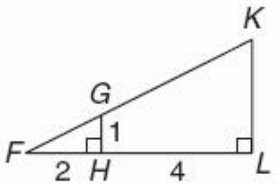
A translation
B rotation
C reflection
D glide reflection
E dilation

25. How many lines of symmetry does a regular octagon have?



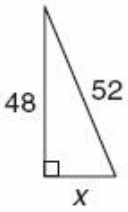
A 2
B 4
C 6
D 8
E 10

26. The figures are similar. What is the approximate length of $\overline{FK}$?



A 3
B 5.2
C 6.7
D 7.9
E 8.3

27. What is the value of x?

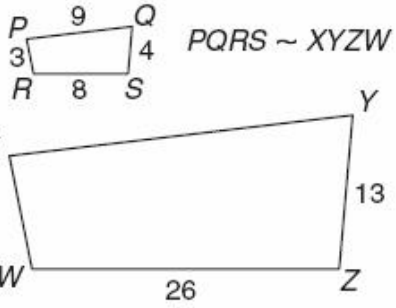


A 20
B 26
C 32
D 34
E 38

28. Which lengths below would NOT form a right triangle?

A 6, 8, 10
B $\sqrt{2}$, $\sqrt{7}$, 3
C 1, 7, $5\sqrt{2}$
D $\sqrt{7}$, 4, 5
E 1, 5, $2\sqrt{6}$

29. The two quadrilaterals are similar. Find the perimeter of the larger figure to the nearest hundredth.



A 24 units
B 54 units
C 78 units
D 86 units
E 92 units

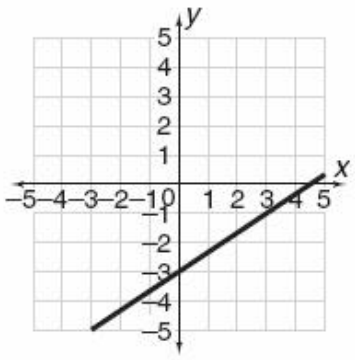
30. A garden is in the shape of a right triangle. If one leg is 16 feet long and the hypotenuse is 20 feet long, how many feet of fencing is required to enclose the garden?

A 28 ft **D** 72 ft
B 36 ft **E** 96 ft
C 48 ft

31. If a triangle has an area of 180 square inches and the height is 12 inches, what is the length of the base?

A 7.5 inches **D** 30 inches
B 15 inches **E** 60 inches
C 18 inches

32. What is the slope of the line?



A -1 **D** $\frac{3}{2}$
B 1 **E** 2
C $\frac{2}{3}$

33. What is the distance between the points $(-8, -4)$ and $(14, 8)$?

A $2\sqrt{17}$ **D** $4\sqrt{34}$
B $2\sqrt{157}$ **E** $10\sqrt{5}$
C $6\sqrt{5}$

34. What is the slope of a line perpendicular to $4x - 3y = 12$?

A $-\frac{3}{4}$ **D** -4
B $\frac{3}{4}$ **E** $\frac{4}{3}$
C $\frac{1}{4}$

Data Analysis, Statistics, and Probability

Use the data in the table for Questions 35–38.

The data shows five male golfers, the country they are from, and the total points they have earned.

Player	Country	Points Earned
Goosen	South Africa	8.53
Mickelson	USA	9.15
Singh	Fiji	10.77
Els	South Africa	8.31
Woods	USA	18.07

35. Who is the top ranked player?

A Goosen
B Mickelson
C Singh
D Els
E Woods

36. What is the average number of points earned by all players?

A 5.69 points
B 7.35 points
C 9.15 points
D 10.97 points
E 54.83 points

37. If you use the data in the table to construct a bar graph based on the number of points earned, which bar would be about twice as tall as Mickelson's?

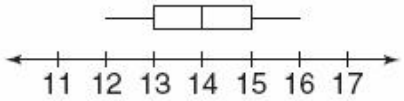
A Goosen
B Woods
C Singh
D Els
E None of them

38. What is the median of the points earned by the top five players?

A 18.07
B 9.15
C 8.53
D 8.31
E 10.77

Use the box and whisker plot for Questions 39 and 40.

Maria is keeping track of the number of trains that go through a particular intersection for one week.



39. What is the first quartile in the distribution of data?

A 12
B 13
C 14
D 15
E 16

40. What is the difference between the median and third quartile?

A 1
B 2
C 3
D 4
E 5

41. A buffet table has a choice of 4 different kinds of meat, 3 kinds of potatoes, 4 vegetables and 2 soups. How many different dinners (meat, potato, vegetable and soup) can be created?

A 13
B 24
C 48
D 72
E 96

42. Annabell collected data on the breed of chicks that customers at J & B Feed ordered. The table shows her findings.

Breed	Number of Customers
White Rock	26
Golden Comet	25
Rhode Island Red	15
Chinese Crested	22
Barred Rock	12

What is the probability that the next customer will order White Rock chicks?

A $\frac{1}{100}$
B $\frac{21}{100}$
C $\frac{13}{50}$
D $\frac{1}{2}$
E $\frac{67}{100}$

43. A coin is tossed and a number cube is rolled. What is the sample space for this experiment?

A {H, T}
B {1, 2, 3, 4, 5, 6}
C {HT, 12, 34, 56}
D {H1, H2, H3, H4, H5, H6, T1, T2, T3, T4, T5, T6}
E {H1, T1, H2, T2, H3, T4}

44. What is the probability of spinning a 4 then a 2 on the next spin?

A $\frac{1}{64}$

B $\frac{1}{16}$

C $\frac{1}{8}$

D $\frac{1}{4}$

E $\frac{1}{2}$

45. Several numbers and letters are put on cards. Jenny hangs them on a wall as shown in the picture and randomly throws a dart at one of the cards.

5	A	3	S
B	Z	8	M
N	7	2	U
E	Q	P	12

What is the probability of a dart that lands on the cards landing on a vowel or a number?

A $\frac{1}{5}$

B $\frac{5}{16}$

C $\frac{3}{8}$

D $\frac{9}{16}$

E $\frac{9}{14}$

Algebra and Functions

46. What is the common ratio for the given sequence?

4, −10, 25, −62.5, 156.25

A −1.5

B 1.5

C 2

D −2.5

E 3

47. What is the missing number in the table?

x	y
−3	7
−2	2
−1	−1
0	−2
1	−1
3	??
4	14

A −2

B 2

C 5

D 7

E 12

48. Mitchell made a display of boxes of cereal. One box of cereal was in the first row, and the other rows each had three more boxes than the row before it. How many boxes of cereal does Mitchell use if the display has seven rows?

A 21 boxes

B 49 boxes

C 64 boxes

D 70 boxes

E 81 boxes

49. Solve for x.

$-12x + 26 = 98$

A −6

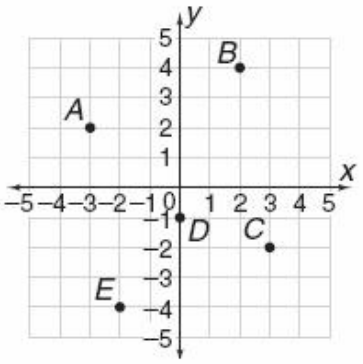
B 5

C 6

D $10\frac{1}{3}$

E 12

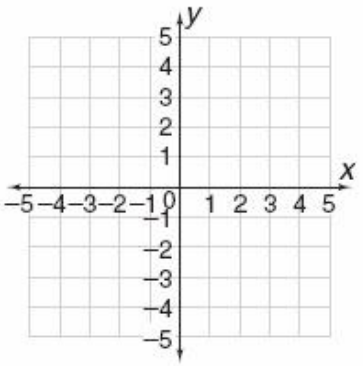
50. What are the coordinates of point *E*?



A (−3, 2)
B (0, −1)
C (2, 4)
D (3, −2)
E (−2, −4)

51. Plot and connect the given points in order and determine the area of the resulting figure.

(−4, 2), (−2, 2), (−2, 4), (1, 4), (1, 3), (3, 3), (3, −4), (−4, −4).

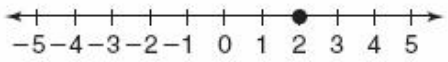


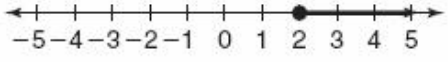
A 25
B 30
C 50
D 62
E 100

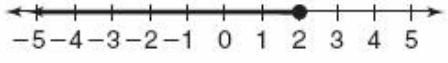
52. Which of the following is the equation of $y = -4x^2 - 3$ shifted 2 units down?

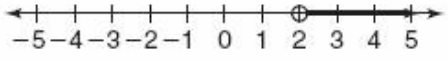
A $y = -4x^2 + 1$
B $y = -4x^2 - 5$
C $y = 4x^2 - 5$
D $y = 4x^2 + 6$
E $y = -4x^2 - 8$

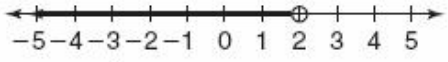
53. Which graph represents the solution of $4x - 9 \leq -1$?

A


B


C


D


E


54. Simplify: $\dfrac{8\sqrt{(3+3)^2 + 2^3 \cdot 8}}{2}$.

A 4
B 10
C 24
D 40
E 80

55. What is the value of $\dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ if $a = 5$, $b = 2$ and $c = -3$?

A $\left\{\frac{3}{5}, -1\right\}$
B $\left\{-\frac{3}{5}, 1\right\}$
C $\{-5, 2\}$
D $\dfrac{5 \pm 2\sqrt{6}}{4}$
E $\left\{\frac{4}{5}, -1\right\}$

56. The function $y = 125{,}000(0.96^x)$ models the population of a bacteria after x minutes. What is the most accurate prediction for the population of the bacteria after 8 minutes?

A 89,128

B 90,174

C 96,000

D 120,000

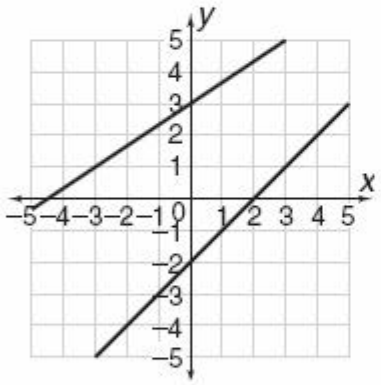
E 1,120,000

57. Which graph is the solution to the system of equations?

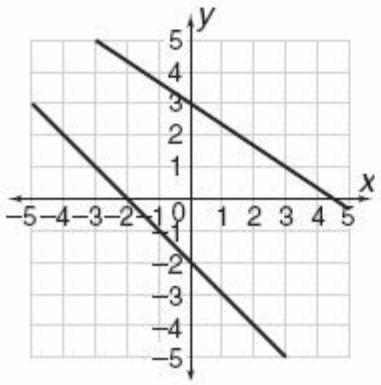
$x + y = -2$

$3y = -2x + 9$

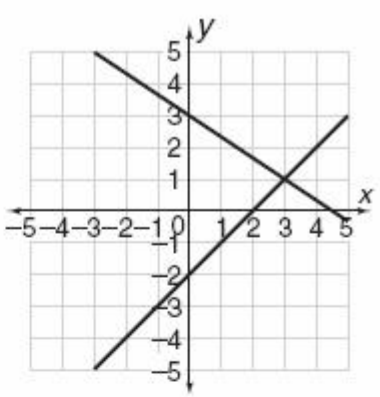
A



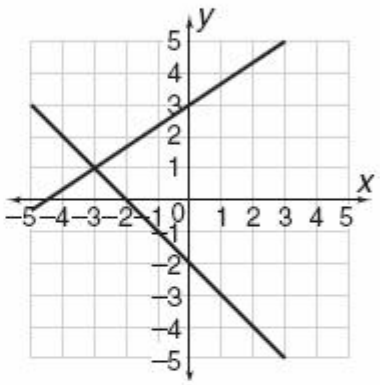
B



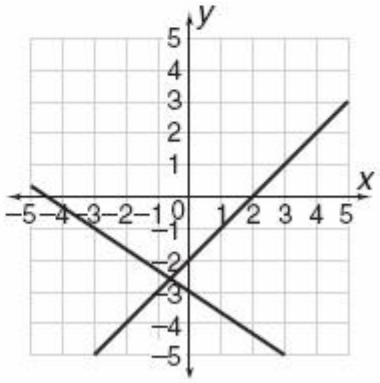
C



D



E



58. What is the x-value in the following system?

$$\begin{cases} 2y - 4 = 4x \\ y - 2 = x \end{cases}$$

A 0
B 1
C 2
D 4
E 8

59. What is the value of m in the matrix equation?

$$\begin{bmatrix} 6 & -2 \\ m & 0 \end{bmatrix} = \begin{bmatrix} n & -2 \\ -4 & 0 \end{bmatrix}$$

A $m = 4$
B $m = -4$
C $m = 0$
D $m = -2$
E $m = 6$

60. What is the value of x in the matrix equation?

$$\begin{bmatrix} -12 & 10 & -11 \\ 10 & 11 & 12 \end{bmatrix} + \begin{bmatrix} 8 & 6 & -5 \\ -8 & 6 & 5 \end{bmatrix} = \begin{bmatrix} x & 16 & -16 \\ 2 & y & 17 \end{bmatrix}$$

A -12
B -4
C -2
D 0
E 16