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Diagnostic Assessment

Number and Quantitative Reasoning

Select the best answer.

1. Which list contains the first four multiples of 13?

A 13, 130, 1300, 13000

B 13, 16, 19, 22

C 13, 14, 15, 16

D 13, 26, 39, 52

2. Which pair of numbers has 7 as its least common multiple?

F 7, 21

G 3, 4

H 14, 28

J 1, 7

3. The number 9 is a factor of which of the following numbers?

A 3 **C** 63

B 19 **D** 109

4. What is the greatest common factor of $6d^2$ and $18d$?

F $6d^2$ **H** $3d^2$

G $6d$ **J** $3d$

5. Which number is not composite?

A 9 **C** 37

B 21 **D** 111

6. Find the value of $\sqrt{49}$.

F 4 **H** 24

G 7 **J** 98

7. Which statement is true?

A $8 \cdot 8 \cdot 8 \cdot 8 \cdot 8 = 5(8)$

B $2 \cdot 2 \cdot 2 = 3^2$

C $5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 = 5^5$

D $6 \cdot 6 \cdot 6 \cdot 6 = 6^4$

8. Evaluate 6^3.

F 3 **H** 108

G 18 **J** 216

9. Round 17.081 to the nearest tenth.

A 17

B 17.1

C 17.08

D 17.8

10. Which fraction is written in simplest form?

F $\frac{121}{11}$ **H** $\frac{23}{3}$

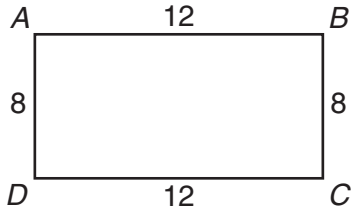
G $\frac{85}{5}$ **J** $\frac{16}{4}$

11. Change $\frac{4}{5}$ to a decimal.

A 0.4 **C** 0.8

B 0.45 **D** 0.85

12. What is the ratio of AB to BC, in simplest form?



F 1 : 1 **H** 3 : 2

G 2 : 3 **J** 4 : 3

13. Which of the following has a unit rate of 17 miles per hour?

A 60 miles in 2 hours

B 85 miles in 5 hours

C 90 miles in 10 hours

D 120 miles in 15 hours

14. Which decimal is equivalent to 22%?

F 0.2

G 0.22

H 2.2

J 22.0

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Diagnostic Assessment

Number and Quantitative Reasoning

15. Write 0.000000082 in scientific notation.

A 82×10^{-9}

B 82×10^{8}

C 0.82×10^{7}

D 8.2×10^{-8}

16. Which statement is true?

F $0.75 < 70\%$

G $6.12 > 6.16$

H $\frac{1}{3} = 30\%$

J $\frac{3}{5} > \frac{4}{7}$

17. Which number set(s) best classifies the number -5?

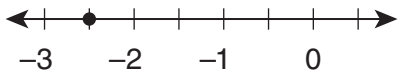
A natural numbers

B whole numbers, integers

C integers, rational numbers

D natural numbers, integers, rational numbers

18. Identify the point graphed on the number line.



F -1.5

G -2.2

H -2.5

J -3.5

Measurement

19. Which measurement is the most appropriate for the radius of a soccer ball?

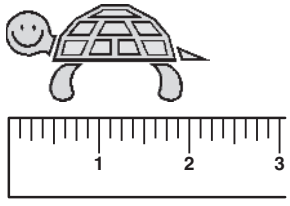
A 4 inches

B 18 inches

C 1 foot

D 3 feet

20. What is the length of the turtle?



F $2\frac{1}{16}$ in.

G $2\frac{1}{4}$ in.

H $2\frac{3}{8}$ in.

J $2\frac{3}{4}$ in.

21. How many liters are in 22,000 milliliters?

A 220 L

B 22 L

C 2.2 L

D 0.22 L

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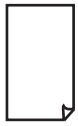
Diagnostic Assessment

Geometry

22. Which of the following represents a ray?

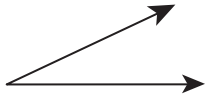
F •

G •—→

H 

J ←—→

23. Classify the angle.



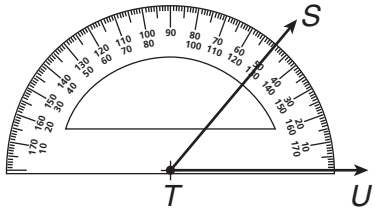
A straight

B obtuse

C right

D acute

24. What is the angle measure of *STU*?



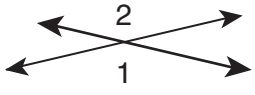
F 20°

G 50°

H 70°

J 130°

25. Select the best description for angles 1 and 2.



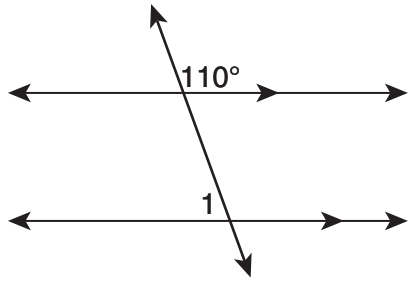
A vertical angles

B adjacent angles

C linear pair

D supplementary

26. Find the measure of angle 1.



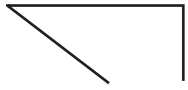
F 70°

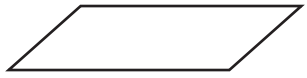
G 80°

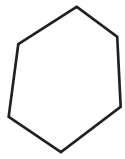
H 90°

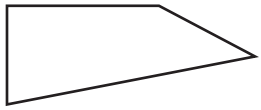
J 110°

27. Which figure is not a polygon?

A 

B 

C 

D 

28. What is the sum of the interior angles in a quadrilateral?

F 90°

G 180°

H 360°

J 720°

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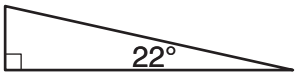
Diagnostic Assessment

Geometry

29. Classify the triangle.

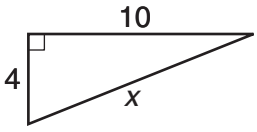


A right
B obtuse
C equilateral
D isosceles

30. Two angles of a triangle are 32° and 110°. What is the measure of the third angle?

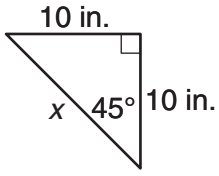
F 218°
G 180°
H 142°
J 38°

31. Given the right triangle below, what is x?



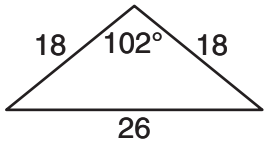
A 9.2
B 10.8
C 84
D 116

32. Find the value of x.

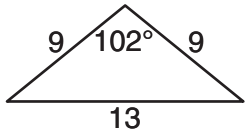


F $\sqrt{2}$ in.
G $10\sqrt{2}$ in.
H 10 in.
J $2\sqrt{10}$ in.

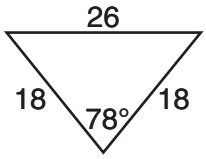
33. Which figure is congruent to this triangle?



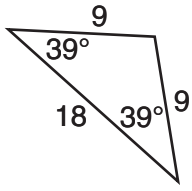
A



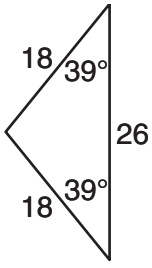
B



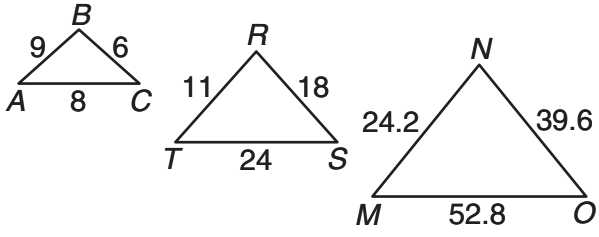
C



D



34. Which similarity statement is true?



F $\triangle ABC \sim \triangle MNO$
G $\triangle ABC \sim \triangle TRS$
H $\triangle TRS \sim \triangle MNO$
J $\triangle TRS \sim \triangle ONM$

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Diagnostic Assessment

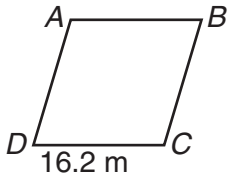
Geometry

35. Triangle *DEF* and triangle *QRS* are right triangles. If $\triangle DEF$ is similar to $\triangle QRS$, and $m\angle EFD = 65°$, which of the following angles also has a measure of 65°?

A $\angle QRS$ **C** $\angle QSR$

B $\angle RQS$ **D** $\angle SQR$

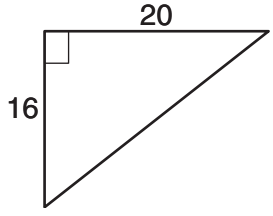
36. Find the perimeter of rhombus *ABCD*.



F 32.4 m **H** 262.44

G 64.8 m **J** 268.96

37. What is the area of a triangle with a height of 20 meters and a base of 16 meters?



A 160 square meters

B 320 square meters

C 640 square meters

D 656 square meters

38. A rectangle has vertices at $P(1, 0)$, $Q(6, 0)$, $R(6, 6)$, and $S(1, 6)$. What is the area of rectangle *PQRS*?

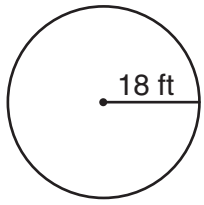
F 11 square units

G 22 square units

H 30 square units

J 150 square units

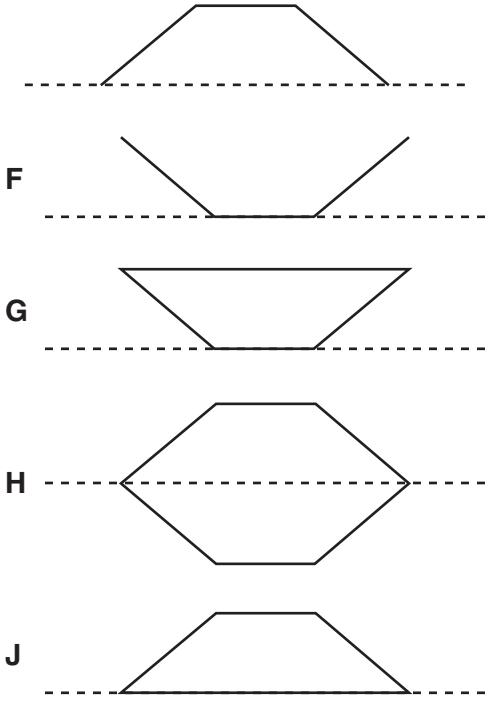
39. Find the circumference.



A 81π **C** 18π

B 36π **D** 9π

40. The figure below has a line of symmetry. Which drawing best shows the completion of the figure?



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Diagnostic Assessment

Geometry

41. Determine the surface area of a rectangular prism with height 5 in., width 7 in., and length 12 in.

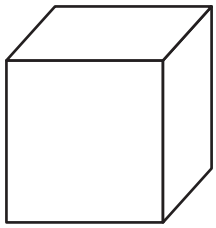
A 24 in.^{2}

B 358 in.^{2}

C 420 in.^{2}

D 840 in.^{2}

42. Determine the volume of a cube with side length 12 ft.



F 36 ft^3

G 144 ft^3

H 864 ft^3

J 1728 ft^3

Operations

43. What is $224 \div 14$?

A 16

B 14

C 12

D 8

44. Find the difference. $18 - 6.8$

F 12.2

G 11.2

H 2.2

J 1.2

45. Find the product. 0.6×1.5

A 0.9

B 9.0

C 9.9

D 90

46. Divide. $12.24 \div 2$

F 2.05

G 6.12

H 8.24

J 24.40

47. Find the product in simplest form.

$\frac{6}{7} \times \frac{2}{3}$

A $\frac{6}{5}$

B $\frac{8}{21}$

C $\frac{4}{7}$

D $\frac{1}{2}$

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Diagnostic Assessment

Operations

48. Subtract. $\frac{7}{9} - \frac{1}{3}$

F $\frac{4}{9}$ **H** 1

G $\frac{2}{3}$ **J** $1\frac{1}{9}$

49. What is 5% of 40?

A 80 **C** 8

B 20 **D** 2

50. What is the simple interest on an investment of $1500 at 5% for 5 years? The simple interest formula is $I = Prt$.

F $60

G $375

H $3750

J $6000

51. Subtract. $-15 - 3$

A -18

B -12

C 12

D 18

52. Multiply. $15(-4)$

F -60

G -11

H 11

J 60

53. Simplify. $\sqrt{\frac{64}{100}}$

A $\sqrt{\frac{4}{10}}$ **C** $\frac{2}{5}$

B $\sqrt{\frac{4}{5}}$ **D** $\frac{4}{5}$

54. Evaluate $|12 - 14 - 6|$.

F -32 **H** 8

G -8 **J** 32

Algebra

55. Simplify the expression. $2 \times (8 - 3) - 6$

A 7

B 4

C 1

D -2

56. Which expression is equivalent to the expression $6(s - 6)$?

F $6s - 6$

G $s - 6$

H $s - 36$

J $6s - 36$

57. Simplify. $18 - c + 9c + 6$

A $24 + 8c^2$

B $32c$

C $24 + 8c$

D $-18c + 15c$

58. Which equation corresponds to the statement "the length ℓ of the rectangle is four times the width w".

F $w = 4 + \ell$

G $w = 4\ell$

H $\ell = 4w$

J $\ell = 4 + w$

59. Simplify. $5x^3 \cdot 6x^2 \cdot x$

A $30x^6$

B $11x^7$

C $30x^7$

D $11x^3$

60. Evaluate $16 - 3s$ for $s = 5$.

F 15

G 8

H 5

J 1

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Diagnostic Assessment

Algebra

61. Divide. $\frac{9r^3}{2r^2}$

A $\frac{9r^3}{2r}$

B $\frac{2r^3}{9r^2}$

C $\frac{2}{9r}$

D $\frac{9r}{2}$

62. Simplify. $5g(g - 9h)$

F $6g^2 - 14gh$

G $5g^2 - 45gh$

H $5g^2 + 5g - 9h$

J $6g^2 - 9h$

63. Simplify. $9x - 4y + 5x - 2y$

A $8xy$

B $14x^2 - 2y^2$

C $14x - 2$

D $14x - 6y$

64. What is the product of $(y + 2)(y - 8)$?

F $y^2 + 6y - 16$

G $y^2 - 6y - 16$

H $y^2 - 6y + 16$

J $y^2 + 6y + 16$

65. What is the product of $(2x - 4)(2x + 4)$?

A $4x^2 - 16$

B $4x^2 + 16x - 16$

C $4x^2 - 16x + 16$

D $4x^2 + 16$

66. Factor $5x^3 - 15x^2$ completely.

F $5x^2$

G $x^2(5x - 15)$

H $5x^2(x - 3)$

J $3x^2(x - 5)$

67. Factor the polynomial, $x^2 + 5x + 6$, completely.

A $(x + 6)(x + 1)$

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

C $(x - 3)(x - 2)$

D $(x - 6)(x + 1)$

68. Solve for x. $8x = -56$

F $x = 64$

G $x = 48$

H $x = -8$

J $x = -7$

69. Solve the equation. $14c - 6 = 22$

A $c = \frac{7}{8}$

B $c = 2$

C $c = 28$

D $c = 308$

70. What value of x makes this equation true? $2x + 18 = 5x$

F $x = -6$

G $x = 4$

H $x = 2.6$

J $x = 6$

71. Solve for x. $x - \frac{2}{5} = \frac{3}{10}$

A $x = \frac{1}{10}$

B $x = \frac{1}{5}$

C $x = \frac{2}{3}$

D $x = \frac{7}{10}$

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Diagnostic Assessment

Algebra

72. Solve $A = \frac{1}{2}bh$ for h.

F $h = \frac{A}{2b}$

G $h = 2Ab$

H $h = \frac{2b}{A}$

J $h = \frac{2A}{b}$

73. Segment CD has endpoints at $C(0, 8)$ and $D(-2, 4)$. Find the midpoint of segment CD.

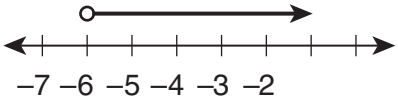
A $(-1, 2)$

B $(1, -3)$

C $(1, 4)$

D $(-1, 6)$

74. The graph shown is the solution to which of the following inequalities?



F $d - 6 \geq 1$

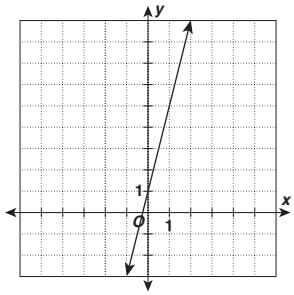
G $4d \leq -24$

H $2d < 12$

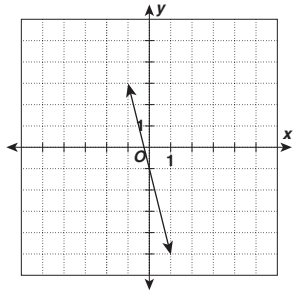
J $\frac{1}{3}d > -2$

75. Which is the graph of the function $y = 4x - 1$?

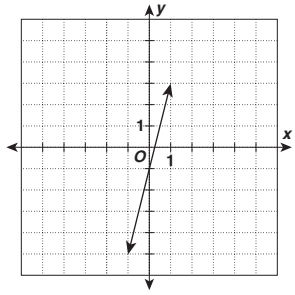
A



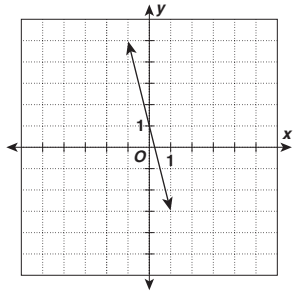
B



C



D



76. Which pair of linear equations represent parallel lines?

F $\begin{cases} y = 2x + 3 \\ y = -2x + 5 \end{cases}$

G $\begin{cases} y = -4x - 3 \\ y = -\frac{1}{4}x + 7 \end{cases}$

H $\begin{cases} y = -6x - 5 \\ y = \frac{1}{6}x - 5 \end{cases}$

J $\begin{cases} y = 8x + 2 \\ y = 8x - 5 \end{cases}$

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Diagnostic Assessment

Algebra

77. Solve the proportion. $\frac{5}{8} = \frac{x}{40}$

A $x = 5$ **C** $x = 25$

B $x = 10$ **D** $x = 37$

78. What table of ordered pairs corresponds to the function $y = -3x + 1$?

F

x	*y*
−2	−5
−1	−2
0	1
1	4
2	7

G

x	*y*
−2	5
−1	2
0	−1
1	−4
2	−7

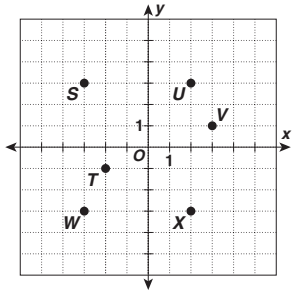
H

x	*y*
−2	7
−1	4
0	1
1	−2
2	−5

J

x	*y*
−2	−7
−1	−4
0	−1
1	2
2	5

79. Which ordered pair corresponds to point *S*?



A $(-3, 3)$

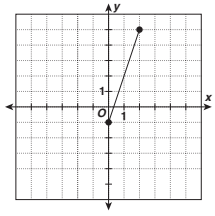
B $(-2, 1)$

C $(3, 2)$

D $(-3, -2)$

80. Graph the function $y = x^2 - 1$ for the domain of $(-2, -1, 0, 1, 2)$.

F



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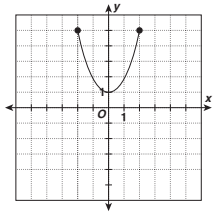

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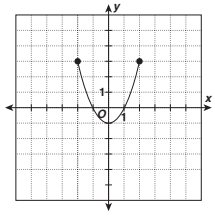

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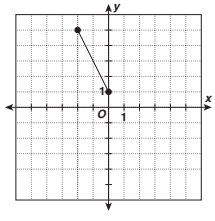


Name _____ Date _____ Class _____

Diagnostic Assessment

Algebra

81. Solve for y. $y^2 - 16 = 9$

A $y = \pm 25$

B $y = \pm 5$

C $y = \pm 4$

D $y = \pm 3$

82. What value completes the square for the expression $x^2 - 6x + \square$?

F 36

G 12

H 9

J 3

Statistics and Data Analysis

83. The table shows the number and type of animals that are on exhibit at the 4-H fair.

Animal	Total
Pig	50
Cow	156
Chicken	28
Horse	78

Find the percentage of animals that are horses.

A 12%

B 25%

C 50%

D 312%

84. Which statement does not represent the data set? 1, 5, 3, 5, 1, 2, 6, 4, 1

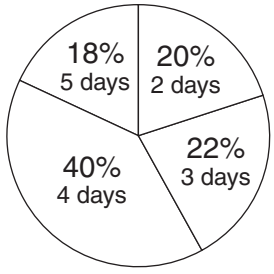
F mean = 4

G median = 3

H mode = 1

J range = 5

85. The runners completing a 10K run were asked how many days per week they train. If 200 runners were surveyed, how many runners said that they train 4 days per week?



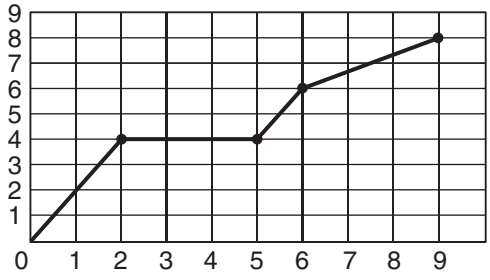
A 8 runners

B 12 runners

C 80 runners

D 120 runners

86. Given the graph below, what is $f(5)$?



F 8

G 6

H 4

J 0

Name _____ Date _____ Class _____

Diagnostic Assessment

Logical Reasoning

87. Which statement can be concluded from the following?

- If two angles are complementary, both angles have measures less than 90°.
- Angle T and angle U are complementary angles.

A $m\angle T > 90°$

B $m\angle T + m\angle U > 90°$

C $m\angle T > m\angle U$

D $m\angle U < 90°$

88. Which conditional statement is always true?

F If two lines intersect, they are perpendicular.

G If two angles in a triangle are acute, the triangle is an obtuse triangle.

H If two lines are parallel, the slope of both lines is the same.

J If a figure is a square, the length of the diagonal is twice the square of the sum of two side lengths.

89. Select the counterexample that makes the statement false.

$|n^2| > n$, where n is a real number

A $n = -10$

B $n = -\frac{1}{5}$

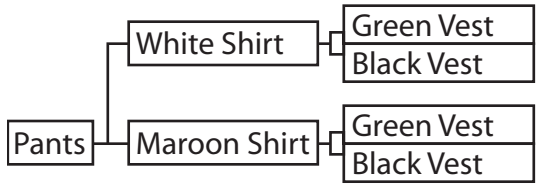
C $n = \frac{1}{2}$

D $n = 5$

Probability

90. Your team uniform consists of one pair of pants, three shirts, and two vests. Which tree diagram can you use to help determine all of the different choices of uniform combinations?

F



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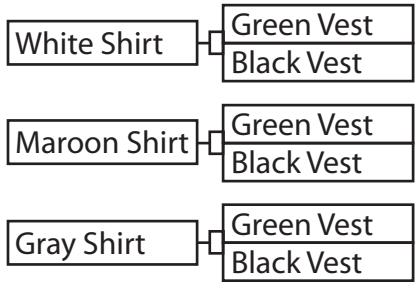

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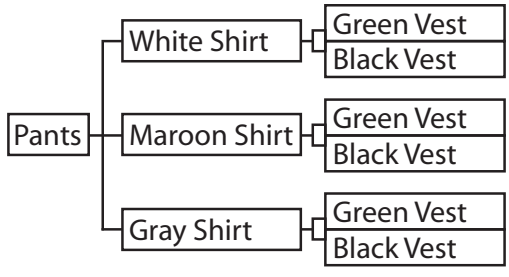

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