Geometry EOI Review

1. **Which of these is an example of deductive reasoning leading to a correct conclusion?**

   A Bill is a Dalmatian. All Dalmatians have spots. Therefore, Bill has spots.

   B All roses are plants. All roses have thorns. Therefore, all plants have thorns.

   C All of Mary's sisters have brown eyes. Linda has brown eyes. Therefore, Linda is Mary's sister.

   D Oak trees have leaves. Maple trees have leaves. Birch trees have leaves. Therefore, all trees have leaves.

2. **If $n + 2$ is divisible by 2, then which statement is <u>always</u> true?**

   A n is an even number.

   B n is an odd number.

   C n is a prime number.

   D n is equal to $n + 1$.

3. **12, 14, 18, 26, 42, _?_ , _?_**

   What are the next two numbers in this sequence?

   A 64, 128

   B 64, 138

   C 74, 128

   D 74, 138

4. **Mary, Dan, Jane, and Lucy walked into a shop at four different times. If Mary went into the shop before Lucy, Jane was the first person after Dan, and Mary was not the first person in the shop, who was the first person to walk into the shop?**

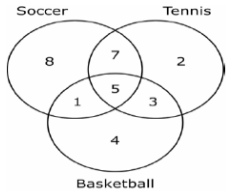
   A Dan

   B Lucy

   C Jane

   D Mary

5. **The Venn diagram shows the number of students who play basketball, soccer, and tennis.**



   How many students play basketball or soccer?

   A 13 students

   B 28 students

   C 34 students

   D 36 students

6. **If the radii of two circles are equal, then the circles are congruent.**

   What is the inverse of the statement above?

   A If the radii of two circles are equal, then the circles are not congruent.

   B If two circles are not congruent, then their radii are unequal.

   C If two circles are congruent, then the radii of the circles are equal.

   D If the radii of two circles are unequal, then the circles are not congruent.

7. **If a polygon is a square, then it is a quadrilateral.**

   What is the converse of this conditional statement?

   A If a quadrilateral is a square, then it is a polygon.

   B If a polygon is a quadrilateral, then it is a square.

   C If a polygon is not a quadrilateral, then it is not a square.

   D If a polygon is not a square, then it is not a quadrilateral.

8. **If a quadrilateral does <u>not</u> have 4 congruent sides, then it is <u>not</u> a rhombus.**

   Which of these statements is the conditional statement that corresponds to the inverse statement above?

   A If a quadrilateral has four congruent sides, then it is a rhombus.

   B If a quadrilateral is a rhombus, then it has four congruent sides.

   C If a quadrilateral has four congruent sides then it is not a rhombus.

   D If a quadrilateral does not have four congruent sides then it is a rhombus.

Geometry EOI Review

9.

If two lines are parallel, then they will never intersect.

Which of these statements follows logically from the statement above?

A If two lines intersect, then they are not parallel.

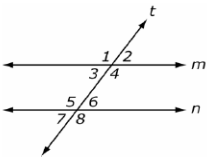
B If two lines are not parallel, then they will never intersect.

C If two lines do not intersect, then they are parallel.

D If two lines are not parallel, then they will intersect.

10.

Transversal *t* cuts parallel lines *m* and *n*.



Which angle is congruent to ∠1?

A ∠2

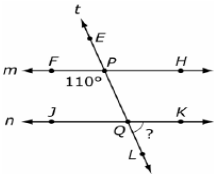
B ∠3

C ∠7

D ∠8

11.

Transversal *t* cuts parallel lines *m* and *n*.



What is the measure of ∠KQL?

A 20°

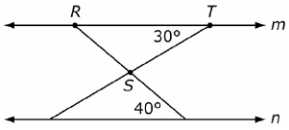
B 55°

C 70°

D 110°

12.

Lines *m* and *n* are parallel.



What is the measure of ∠RST?

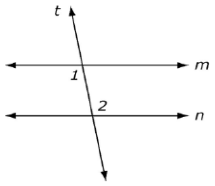
A 20°

B 70°

C 90°

D 110°

13.



Which statement must be true about ∠1 and ∠2 in order for line *m* and line *n* to be parallel?

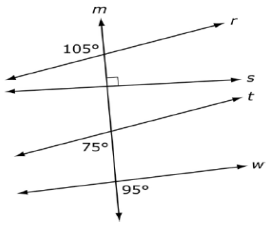
A Their measures must be equal.

B Their measures must be supplementary.

C Their measures must be complementary.

D The measure of ∠1 must be greater than the measure of ∠2.

14.



Line *m* intersects lines *r, s, t, and w*. Which statement must be true?

A Lines *r* and *s* are parallel.

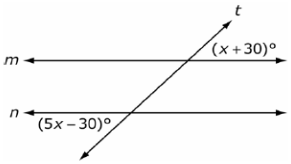
B Lines *r* and *t* are parallel.

C Lines *r* and *w* are parallel.

D Lines *s* and *w* are parallel.

15.

Line *t* intersects lines *m* and *n*.



For what value of *x* are lines *m* and *n* parallel?

A 12

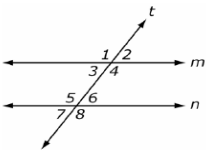
B 15

C 30

D 45

16.

Line *t* intersects lines *m* and *n*.



Which angle has to be supplementary to ∠6 for lines *m* and *n* to be parallel?

A ∠2

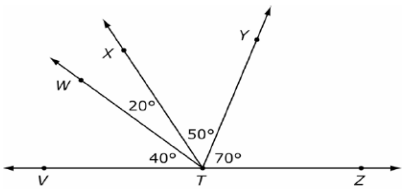
B ∠4

C ∠7

D ∠8

Geometry EOI Review

17.



Which angle is supplementary to ∠*WTV*?

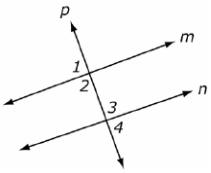
A ∠*XTY*

B ∠*XTZ*

C ∠*WTZ*

D ∠*WTX*

18.



If ∠*3* ≅ ∠*4*, which statement must be true?

A Line m is parallel to line *n*.

B Line *m* is perpendicular to line *n*.

C Line *n* is parallel to line *p*.

D Line *n* is perpendicular to line *p*.

19.

The measures of two complementary angles are $(2x + 2)^0$ and $(3x - 5)^0$. What is the measure of the smaller angle?

A 36.8°

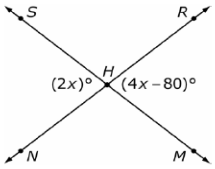
B 39.2°

C 47.2°

D 50.8°

20.

Two lines intersect at point *H*.



What is the measure in degrees of ∠*RHS*?

A 40°

B 80°

C 90°

D 100°

21.

How many sides does a heptagon have?

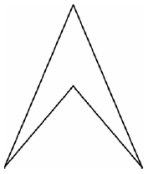
A 5 sides

B 6 sides

C 7 sides

D 8 sides

22.



What type of figure is shown?

A convex triangle

B convex quadrilateral

C concave triangle

D concave quadrilateral

23.

What is the measure in degrees of an interior angle of an equiangular triangle?

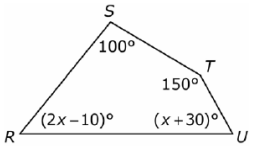
A 30°

B 45°

C 60°

D 120°

24.



Given quadrilateral *RSTU*, what is the value of *x*?

A 15

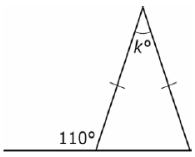
B 30

C 45

D 60

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25.



What is the value of *k*?

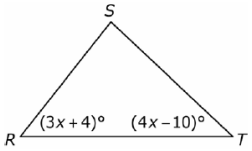
A 35

B 40

C 55

D 70

26.



In terms of *x*, what is the measure of $\angle S$?

A $(7x - 14)°$

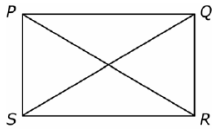
B $(7x - 6)°$

C $(86 - 7x)°$

D $(186 - 7x)°$

27.

For rectangle *PQRS*, the diagonal from *P* to *R* is 100 feet.



How long is the diagonal from *Q* to *S*?

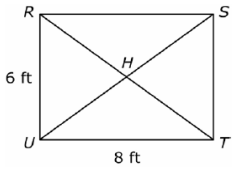
A 50 feet

B 100 feet

C 141 feet

D 200 feet

28.



For rectangle *RSTU*, what is the length of $\overline{HT}$?

A 4 ft

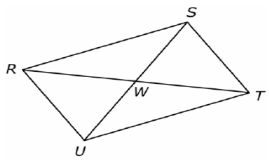
B 5 ft

C 6 ft

D 10 ft

29.

In the parallelogram *RSTU*, the diagonals $\overline{RT}$ and $\overline{SU}$ intersect at point *W*.



If $RW = 2x + 2$ and $RT = 3x + 8$, what is the length of $\overline{WT}$?

A 4

B 8

C 10

D 20

30.

Robert wants to build a fence around his perfectly square garden. If the area of the garden is 100 square feet, how many feet of fence will he need?

A 10 feet

B 20 feet

C 40 feet

D 100 feet

31.

Susan's circular swimming pool has an area of 314 square feet. What is the approximate diameter of the pool? (Use 3.14 for π.)

$$A = \pi r^2$$

A 10 feet

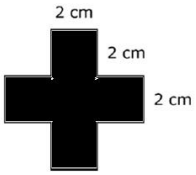
B 20 feet

C 30 feet

D 60 feet

32.

This shaded figure is composed of 5 squares.



What is the area of this shaded figure?

A 8 cm^2

B 16 cm^2

C 20 cm^2

D 24 cm^2

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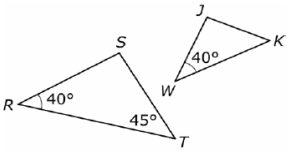
33. Four circular parks of different sizes are to be surrounded with fence. Park 1 has half the diameter of Park 2, one third the diameter of Park 3, and one fourth the diameter of Park 4. If one bundle of fence exactly surrounds park 2, how many bundles of fence will be used in this project?

A 3 bundles

B 5 bundles

C 6 bundles

D 8 bundles

34. 

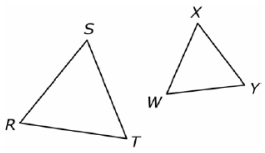
Which additional fact proves that $\triangle RST$ and $\triangle WJK$ are similar?

A The measure of $\angle J$ is 40°.

B The measure of $\angle J$ is 95°.

C The measure of $\angle K$ is 40°.

D The measure of $\angle K$ is 95°.

35. 

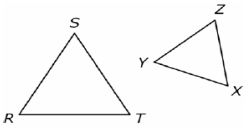
Which pair of facts proves that $\triangle RST$ and $\triangle WXY$ are similar?

A $\angle S \cong \angle X$ and $\angle R \cong \angle W$

B $\overline{ST} \cong \overline{WX}$ and $\angle T \cong \angle W$

C $\overline{RS} \cong \overline{WY}$ and $\angle R \cong \angle Y$

D $\overline{RS} \cong \overline{WY}$ and $\overline{RT} \cong \overline{WX}$

36. 

If triangle *RST* and triangle *XYZ* are similar, which of these equations must be true?

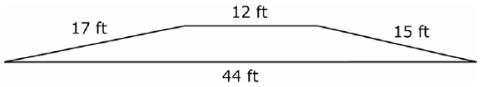
A $\frac{ST}{YZ} = \frac{RT}{XZ}$

B $\frac{ST}{YZ} = \frac{SR}{XZ}$

C $\frac{RT}{YZ} = \frac{RT}{XZ}$

D $\frac{RT}{XZ} = \frac{RS}{YZ}$

37. **Chris is planning a play area shaped like this polygon.**



She draws a model similar to the desired play area. If the length of the longest side of her model is 33 cm, what is the length of the shortest side of the model?

A 9 cm

B 12 cm

C 13 cm

D 16 cm

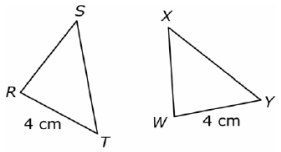
38. The ratio of the perimeter of square *RSTU* to the perimeter of square *WXYZ* is 1 to 2. The area of square *RSTU* is 25 square inches. What is the area of square *WXYZ*?

A 20 sq in.

B 25 sq in.

C 50 sq in.

D 100 sq in.

39. 

Which additional facts prove that $\triangle RST$ and $\triangle WXY$ are congruent?

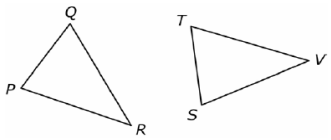
A $\overline{RS} \cong \overline{WX}$ and $\overline{ST} \cong \overline{XY}$

B $\overline{RS} \cong \overline{WX}$ and $\overline{RT} \cong \overline{XY}$

C $\overline{RT} \cong \overline{WY}$ and $\overline{ST} \cong \overline{XY}$

D $\overline{RT} \cong \overline{WY}$ and $\overline{RS} \cong \overline{WX}$

40. **In the diagram, $\triangle PQR \cong \triangle TSV$.**



Which of these must be true?

A $\overline{QR} \cong \overline{ST}$

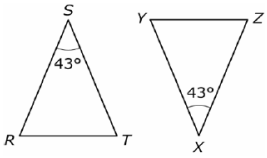
B $\overline{QR} \cong \overline{SV}$

C $\overline{PR} \cong \overline{ST}$

D $\overline{PR} \cong \overline{SV}$

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41.



Which additional facts prove that $\triangle RST$ and $\triangle ZXY$ are congruent?

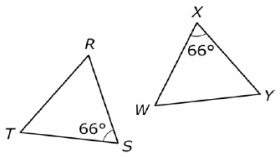
A $\angle R \cong \angle Z$ and $\angle T \cong \angle Y$

B $\angle R \cong \angle Y$ and $\angle T \cong \angle Z$

C $\overline{RS} \cong \overline{XZ}$ and $\overline{RT} \cong \overline{ZY}$

D $\overline{RS} \cong \overline{XZ}$ and $\overline{ST} \cong \overline{XY}$

42.



Which additional facts prove that $\triangle RST$ and $\triangle WXY$ are congruent?

A $\overline{RS} \cong \overline{XY}$ and $\overline{TS} \cong \overline{WY}$

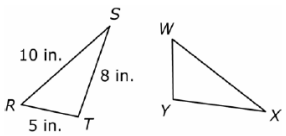
B $\overline{RS} \cong \overline{WX}$ and $\overline{RT} \cong \overline{WY}$

C $\angle R \cong \angle W$ and $\overline{RS} \cong \overline{WX}$

D $\angle R \cong \angle W$ and $\angle T \cong \angle Y$

43.

$\triangle RST$ and $\triangle WXY$ are congruent.



What is the measure of $\overline{WX}$?

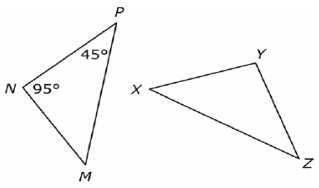
A 5 in.

B 8 in.

C 9 in.

D 10 in.

44.



If $\triangle MNP \cong \triangle XYZ$, what are $m\angle YXZ$ and $m\angle ZYX$?

A $m\angle YXZ = 40°$ and $m\angle ZYX = 45°$

B $m\angle YXZ = 45°$ and $m\angle ZYX = 40°$

C $m\angle YXZ = 40°$ and $m\angle ZYX = 95°$

D $m\angle YXZ = 95°$ and $m\angle ZYX = 45°$

45.

Circle *R* and Circle *T* are congruent. The area of Circle *R* is 12.56 square feet. To the nearest tenth of a foot, what is the circumference of Circle *T*? (Use 3.14 for π.)

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

A 3.1 feet

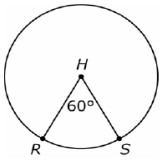
B 6.3 feet

C 12.6 feet

D 25.1 feet

46.

The center of this circle is *H*.



What is the measure of $\overset{\frown}{RS}$?

A 15°

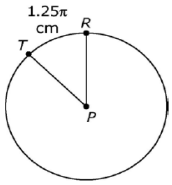
B 30°

C 60°

D 120°

47.

The center of this circle is *P*.



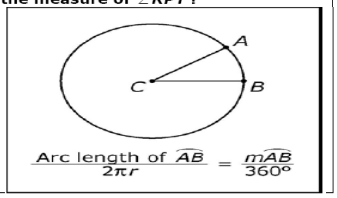
If the length of $\overline{PT}$ is 5 cm, what is the measure of $\angle RPT$?

A 22.5°

B 45°

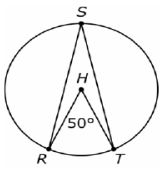
C 67.5°

D 90°



48.

The center of this circle is *H*.



What is the measure of $\angle RST$?

A 25°

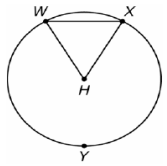
B 50°

C 75°

D 100°

Geometry EOI Review

49. In this circle, H is the center, and $\triangle WXH$ is an equiangular triangle.



What is the measure of $\overset{\frown}{WYX}$?

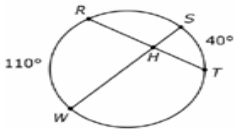
A 60°

B 120°

C 300°

D 320°

50. Chords $\overline{RT}$ and $\overline{WS}$ intersect at point H in this circle.



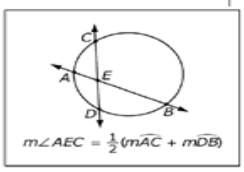
What is the measure of $\angle RHW$?

A 40°

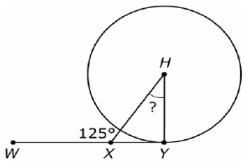
B 75°

C 110°

D 150°



51. In the circle, H is the center, and $\overline{XY}$ is tangent to the circle.



What is the measure of $\angle XHY$?

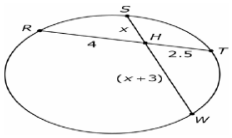
A 25°

B 35°

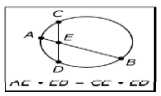
C 90°

D 125°

52. Chords $\overline{RT}$ and $\overline{WS}$ intersect at point H in this circle.



What is the value of x?



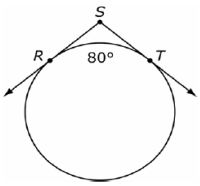
A 2

B 2.5

C 4

D 5

53. The measure of arc RT is 80°.



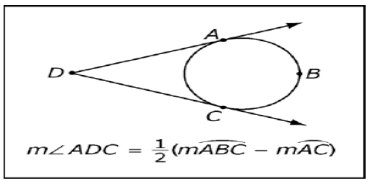
What is the measure of $\angle RST$?

A 50°

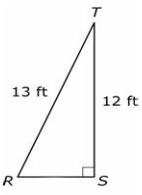
B 80°

C 100°

D 160°



54.



For the right triangle RST, what is the length of $\overline{RS}$?

A 4 feet

B 5 feet

C 12.5 feet

D 25 feet

55. Which set of measurements could be the side lengths of an obtuse triangle?

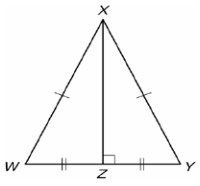
A 3 in., 4 in., 4 in.

B 5 in., 12 in., 13 in.

C 6 in., 7 in., 12 in.

D 6 in., 8 in., 9 in.

56. In isosceles triangle WXY, $\overline{XY}$ is 13 inches in length and $\overline{WY}$ is 10 inches in length.



What is the length of $\overline{XZ}$?

A 5 in.

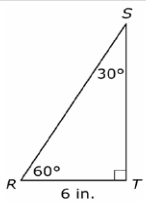
B 6 in.

C 12 in.

D 18 in.

Geometry EOI Review

57.



In $\triangle RST$, what is the length in inches of $\overline{ST}$?

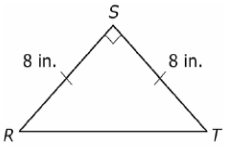
A 6 in.

B $6\sqrt{2}$ in.

C $6\sqrt{3}$ in.

D 12 in.

58.



What is the measure of $\angle R$?

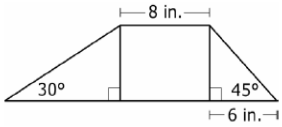
A 30°

B 45°

C 60°

D 80°

59.



In radical form, what is the perimeter of this trapezoid?

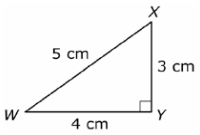
A $30 + 6\sqrt{3} + 6\sqrt{2}$ in.

B $34 + 6\sqrt{3} + 6\sqrt{2}$ in.

C $30 + 8\sqrt{3} + 8\sqrt{2}$ in.

D $38 + 8\sqrt{3} + 6\sqrt{2}$ in.

60.



What is the tangent ratio of angle W?

A $\frac{3}{4}$

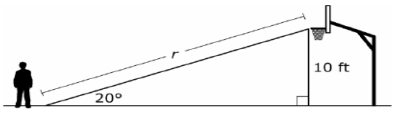
B $\frac{3}{5}$

C $\frac{4}{3}$

D $\frac{4}{5}$

61.

Michael wants to build a ramp to reach a basketball rim that is 10 feet high, and the angle of elevation from the floor where he is standing to the rim is 20 degrees.



Which equation can be used to find the length of the ramp, r?

A $\sin 20° = \frac{10}{r}$

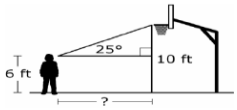
B $\cos 20° = \frac{10}{r}$

C $\sin 20° = \frac{r}{10}$

D $\cos 20° = \frac{r}{10}$

62.

A basketball player looks directly at the rim that is 10 feet high. The angle of elevation from her eye level, which is 6 feet above the ground, to the rim is 25 degrees.



sin 25° ≈ 0.42
cos 25° ≈ 0.91
tan 25° ≈ 0.47

To the nearest foot, how far away from the rim is she standing?

A 6 ft

B 9 ft

C 21 ft

D 25 ft

63.

Which polyhedron has 8 faces?

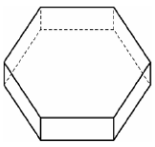
A hexagonal prism

B pentagonal prism

C hexagonal pyramid

D pentagonal pyramid

64.



Which type of polyhedron is shown?

A hexagonal prism

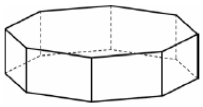
B pentagonal prism

C hexagonal pyramid

D pentagonal pyramid

Geometry EOI Review

65.



What is the sum of the number of faces, edges, and vertices for an octagonal prism?

A 40

B 48

C 50

D 64

66. Kevin has a spherical ball with a diameter of 20 centimeters. To the nearest square centimeter, what is the surface area of the ball? (Use 3.14 for π.)

$SA = 4\pi r^2$

A 628 square centimeters

B 1,256 square centimeters

C 4,187 square centimeters

D 5,024 square centimeters

67. A cylindrical fish food package has a volume of 2,512 cubic centimeters. The diameter of the package is 20 centimeters. What is the height of the package to the nearest centimeter? (Use 3.14 for π.)

$V = \pi r^2 h$

A 2 cm

B 4 cm

C 8 cm

D 10 cm

68. Which cylinder would require the most paint to cover?

$SA = 2\pi r^2 + 2\pi rh$

A a cylinder with radius 2 and height 4

B a cylinder with radius 3 and height 3

C a cylinder with radius 4 and height 2

D a cylinder with radius 5 and height 1

69. Two similar cones have heights 8 cm and 10 cm. What is the ratio of their surface areas?

A 1:2

B 4:5

C 8:25

D 16:25

70. A rectangular prism has a length of 4 feet, a width of 2 feet, and a height of 6 feet. If a larger and similar rectangular prism has a length of 8 feet what is the volume of the larger rectangular prism?

$V = Bh$

A 48 cu ft

B 96 cu ft

C 384 cu ft

D 512 cu ft

71. Two holiday presents are in the shape of cubes. The ratio of the side lengths of the presents is 3 to 1. If the side length of the larger present is 12 inches, what is the volume of the smaller present?

$V = s^3$

A 27 cu in.

B 36 cu in.

C 64 cu in.

D 1,728 cu in.

72. A box in the shape of a rectangular prism with a square base has a volume of 18 cubic feet. The height is 2 feet. What is the volume of a similar box whose square base has an area of 36 square feet?

$V = Bh$

A 18 cu ft

B 36 cu ft

C 72 cu ft

D 144 cu ft

Geometry EOI Review

73. **Marco has two congruent globes. The diameter of one globe at the equator is 10 inches. Which is closest to the surface area of the other globe? (Use 3.14 for π.)**

$SA = 4\pi r^2$

A 157 square inches

B 314 square inches

C 628 square inches

D 1,256 square inches

74. **Mona has two congruent sugar cubes. The surface area of the first sugar cube is 150 square millimeters. What is the length of a side of the second sugar cube?**

$SA = 6B$

A 2 millimeters

B 5 millimeters

C 10 millimeters

D 15 millimeters

75. **Samantha is making pincushions that are congruent rectangular prisms. The volume of one pincushion is 96 cubic centimeters, the height is 2 centimeters, and the length is 6 centimeters. What is the width of the other pincushion?**

$V = Bh$

A 2 centimeters

B 4 centimeters

C 6 centimeters

D 8 centimeters

76. **Cylinders A and B are congruent. Cylinder A has a height of 3 inches and a lateral area of 30π square inches. What is the surface area of cylinder B?**

$LA = 2\pi rh$

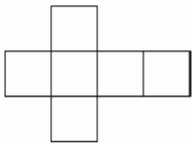
$SA = 2\pi r^2 + 2\pi rh$

A 30π square inches

B 50π square inches

C 55π square inches

D 80π square inches

77. 

Which polyhedron is <u>best</u> represented by this net?

A hexagon

B hexahedron

C hexagonal prism

D hexagonal pyramid

78. **What shapes would appear in drawing a net for a square pyramid?**

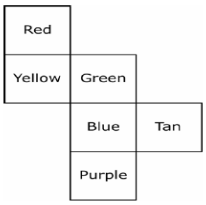
A 1 square and 3 triangles

B 1 square and 4 triangles

C 4 squares and 3 triangles

D 4 squares and 4 triangles

79. **Imagine that this net will be folded into a cube.**



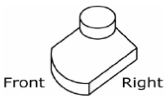
Which color will <u>not</u> be adjacent to the red face?

A Purple

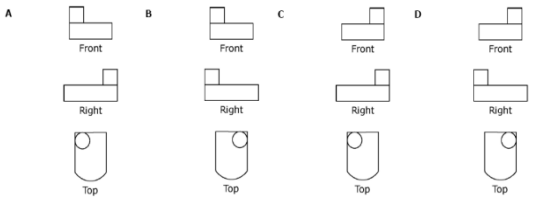
B Green

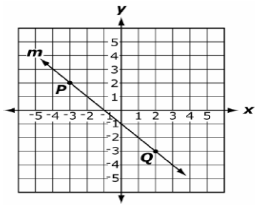
C Blue

D Tan

80. 

Which set shows the front, right, and top views of this three-dimensional figure?



81. 

What is the slope of a line parallel to line *m*?

A −1

B −2

C −3

D −5

Geometry EOI Review

82. Line m has a slope of 3. Line n is perpendicular to line m. What is the slope of line n?

A $-\frac{1}{3}$

B $\frac{1}{3}$

C -3

D 3

83. What is the distance between $(4, -1)$ and $(-2, 3)$?

Distance between two points $P_1(x_1, y_1)$ and $P_2(x_2, y_2)$:

$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

A $\sqrt{17}$

B $\sqrt{34}$

C $5\sqrt{2}$

D $2\sqrt{13}$

84. Point S is the midpoint of $\overline{RT}$. The coordinates of points R and S are $(-1, -3)$ and $(5, -5)$, respectively. What are the coordinates of point T?

Midpoint between two points $P_1(x_1, y_1)$ and $P_2(x_2, y_2)$:

$$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

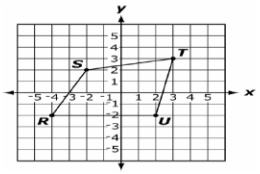
A $(7, 1)$

B $(2, -4)$

C $(7, -11)$

D $(11, -7)$

85. What is the most specific name for figure $RSTU$?



A square

B rhombus

C quadrilateral

D parallelogram

86. Which type of triangle has vertices at the points $R(2, 1)$, $S(2, 5)$, and $T(4, 1)$?

A right

B acute

C isosceles

D equilateral

87. Which quadrilateral can be represented by points R $(-4, 1)$, S $(-1, 4)$, T $(5, -2)$, and U $(2, -5)$?

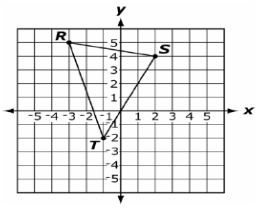
A kite

B square

C rhombus

D rectangle

88.



How many units down would triangle RST need to be translated in order for the coordinates of R' to be $(-3, 0)$?

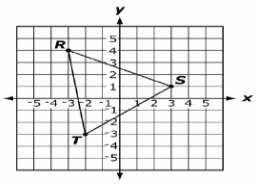
A 0 units

B 3 units

C 5 units

D 7 units

89.



What are the coordinates of R' after $\triangle RST$ is rotated 90° clockwise about the origin?

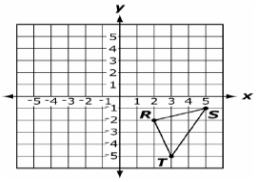
A $(-3, -4)$

B $(-4, -3)$

C $(3, 4)$

D $(4, 3)$

90.



In this grid, $\triangle RST$ is reflected across the y-axis and then translated 1 unit up to create $\triangle R'S'T'$. What are the coordinates for S'?

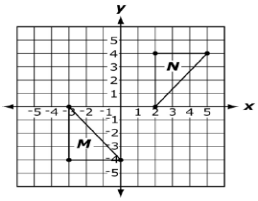
A $(-5, -2)$

B $(-5, 0)$

C $(-4, -1)$

D $(-4, 0)$

91.



Which statement describes the transformation that would map triangle M to triangle N on this grid?

A $(x, y) \rightarrow (-x + 5, -y)$

B $(x, y) \rightarrow (-x + 5, y)$

C $(x, y) \rightarrow (x + 5, -y)$

D $(x, y) \rightarrow (x + 5, y)$