MHS EOC Geometry Study Guide Choice Board

Name: ________________________________Date:___________ _________Teacher:____________________________

Directions: Look through the following choices and decide how you want to make your grade add up to 32 points. Choose any problems you want from each unit. Your combination can exceed 32 points which will be considered bonus points.

A. Unit 1 - Transformations in the Coordinate Plane – 3 points (3 problems)

Building on standards from middle school, students will perform transformations in the coordinate plane, describe a sequence of transformations that will map one figure onto another, and describe transformations that will map a figure onto itself. Students will compare transformations that preserve distance and angle to those that do not.

B. Unit 2 - Similarity, Congruence, and Proofs – 7 points (7 problems)

Building on standards from Unit 1 and from middle school, students will use transformations and proportional reasoning to develop a formal understanding of similarity and congruence. Students will identify criteria for similarity and congruence of triangles, develop facility with geometric proofs (variety of formats), and use the concepts of similarity and congruence to prove theorems involving lines, angles, triangles, and other polygons.

C. Unit 3 - Right Triangle Trigonometry – 5 points (5 problems)

Students will apply similarity in right triangles to understand right triangle trigonometry. Students will use the Pythagorean Theorem and the relationship between the sine and cosine of complementary angles to solve problems involving right triangles.

D. Unit 4 – Circles and Volume – 5 points (5 problems)

Students will understand and apply theorems about circles, find arc lengths of circles, and find areas of sectors of circles. Students will develop and explain formulas related to circles and the volume of solid figures and use the formulas to solve problems. Building on standards from middle school, students will extend the study of identifying cross-sections of three-dimensional shapes to identifying three-dimensional objects generated by rotations of two-dimensional objects.

E. Unit 5 – Geometric and Algebraic Connections –5 points (5 problems)

Students will use the concepts of distance, midpoint, and slope to verify algebraically geometric relationships of figures in the coordinate plane (triangles, quadrilaterals, and circles). Students will solve problems involving parallel and perpendicular lines, perimeters and areas of polygons, and the partitioning of a segment in a given ratio. Students will derive the equation of a circle and model real-world objects using geometric shapes and concepts.

F. Unit 6 - Applications of Probability – 5 points (5 problems)

Students will understand independence and conditional probability and use them to interpret data. Building on standards from middle school, students will formalize the rules of probability and use the rules to compute probabilities of compound events in a uniform probability model.

Mark the choices you completed and total up your points. You can total over 32 points to get extra credit.

Letter	Assignment Choices	Teacher use only
A	____ **Unit 1 - Transformations in the Coordinate Plane**	_______________/3
B	____ **Unit 2 – Similarity, Congruence, and Proofs**	_______________/7
C	____ **Unit 3 – Right Triangle Trigonometry**	_______________/5
D	____ **Unit 4 – Circles and Volume**	_______________/5
E	____ **Unit 5 – Geometric and Algebraic Connections**	_______________/5
F	____ **Unit 6 – Applications of Probability**	_______________/5
	_______ **Total Points Earned** **Total**	**_______________30**

Geometry Formula Sheet

Below are the formulas you may find useful as you take the test. However, you may find that you do not need to use all of the formulas. You may refer to this formula sheet as often as needed.

Geometry Formulas

Perimeter

The perimeter of a polygon is equal to the sum of the length of its sides.

Distance Formula

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

Coordinates of point which partitions a directed line segment AB at the ratio of $a{:}b$ from $A(x_1, y_1)$ to $B(x_2, y_2)$

$$(x, y) = \left(\frac{bx_1 + ax_2}{b + a}, \frac{by_1 + ay_2}{b + a}\right)$$

OR

$$(x, y) = \left(x_1 + \frac{a}{a + b}(x_2 - x_1), y_1 + \frac{a}{a + b}(y_2 - y_1)\right)$$

Circumference of a Circle

$C = \pi d$ or $C = 2\pi r$

$\pi \approx 3.14$

Arc Length of a Circle

$$\text{Arc Length} = \frac{2\pi r\theta}{360}$$

Area

Triangle	$A = \frac{1}{2}bh$
Rectangle	$A = bh$
Circle	$A = \pi r^2$

Area of a Sector of a Circle

$$\textit{Area of Sector} = \frac{\pi r^2\theta}{360}$$

Pythagorean Theorem

$a^2 + b^2 = c^2$

Trigonometric Relationships

$$\sin\theta = \frac{opp}{hyp}; \quad \cos\theta = \frac{adj}{hyp}; \quad \tan\theta = \frac{opp}{adj}$$

Equation of a Circle

$(x - h)^2 + (y - k)^2 = r^2$

Volume

Cylinder	$V = \pi r^2 h$
Pyramid	$V = \frac{1}{3}Bh$
Cone	$V = \frac{1}{3}\pi r^2 h$
Sphere	$V = \frac{4}{3}\pi r^3$

Statistics Formulas

Conditional Probability

$$P(A|B) = \frac{P(A \text{ and } B)}{P(B)}$$

Multiplication Rule for Independent Events

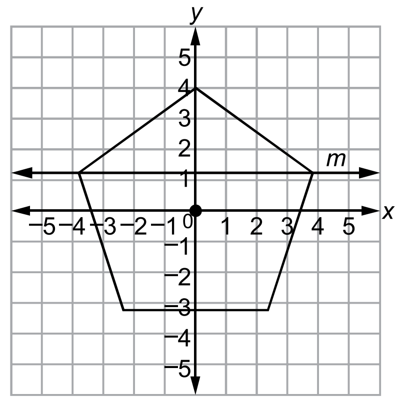
$P(A \text{ and } B) = P(A) \cdot P(B)$

Addition Rule

$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$

SAMPLE ITEMS

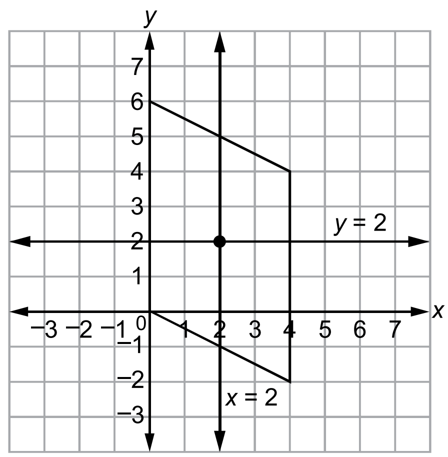
1. A regular pentagon is centered about the origin and has a vertex at (0, 4).



Which transformation maps the pentagon to itself?

A. a reflection across line *m*
B. a reflection across the *x*-axis
C. a clockwise rotation of 100° about the origin
D. a clockwise rotation of 144° about the origin

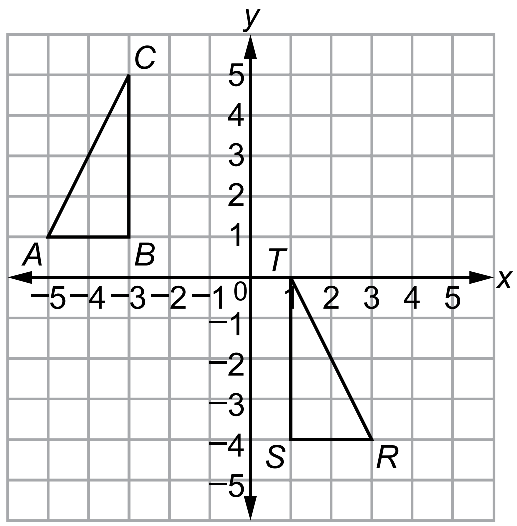
2. A parallelogram has vertices at (0, 0), (0, 6), (4, 4), and (4, –2).



Which transformation maps the parallelogram to itself?

A. a reflection across the line $x = 2$
B. a reflection across the line $y = 2$
C. a rotation of 180° about the point (2, 2)
D. a rotation of 180° about the point (0, 0)

3. Which sequence of transformations maps △*ABC* to △*RST*?

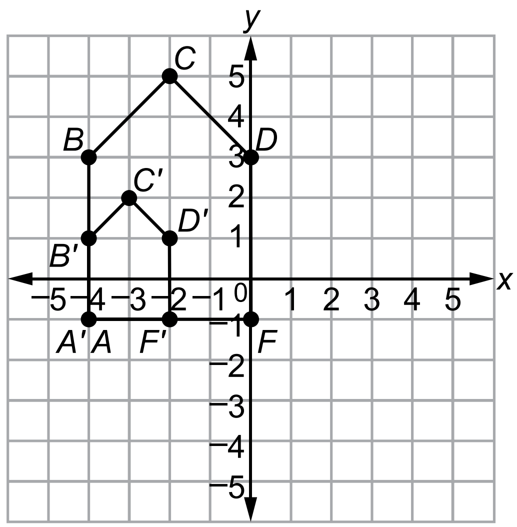


A. Reflect △*ABC* across the line $x = -1$. Then translate the result 1 unit down.
B. Reflect △*ABC* across the line $x = -1$. Then translate the result 5 units down.
C. Translate △*ABC* 6 units to the right. Then rotate the result 90° clockwise about the point (1, 1).
D. Translate △*ABC* 6 units to the right. Then rotate the result 90° counterclockwise about the point (1, 1).

[redacted]

SAMPLE ITEMS

1. Figure $A'B'C'D'F'$ is a dilation of figure $ABCDF$ by a scale factor of $\frac{1}{2}$. The dilation is centered at (–4, –1).



Which statement is true?

A. $\frac{AB}{A'B'} = \frac{B'C'}{BC}$

B. $\frac{AB}{A'B'} = \frac{BC}{B'C'}$

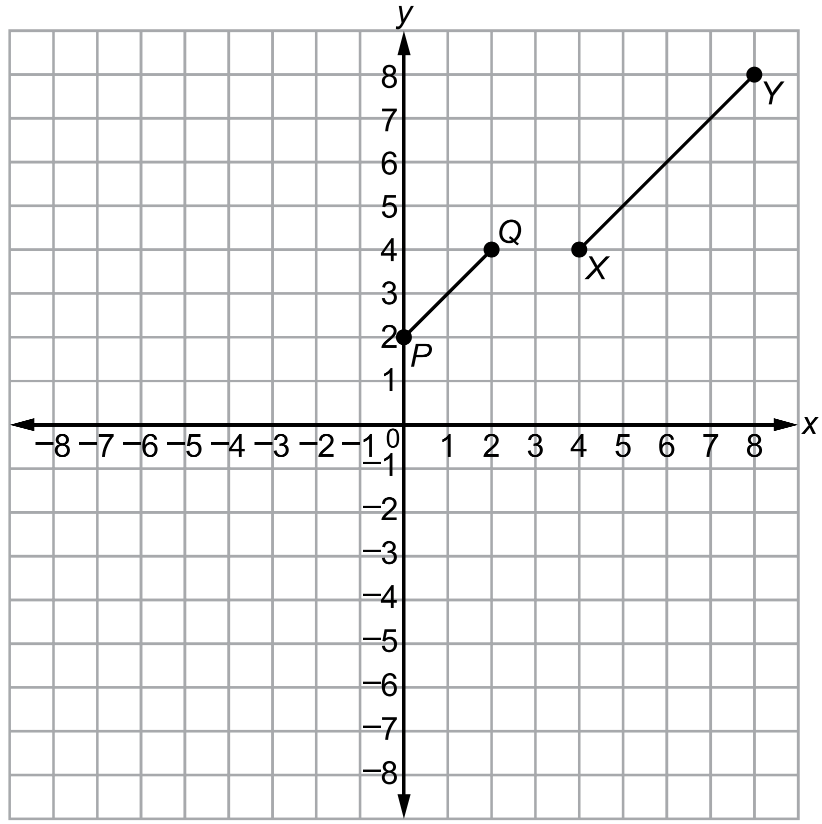
C. $\frac{AB}{A'B'} = \frac{BC}{D'F'}$

D. $\frac{AB}{A'B'} = \frac{D'F'}{BC}$

2. Which transformation results in a figure that is similar to the original figure but has a greater area?

A. a dilation of triangle *QRS* by a scale factor of 0.25
B. a dilation of triangle *QRS* by a scale factor of 0.5
C. a dilation of triangle *QRS* by a scale factor of 1
D. a dilation of triangle *QRS* by a scale factor of 2

3. In the coordinate plane, segment $\overline{PQ}$ is the result of a dilation of segment $\overline{XY}$ by a scale factor of $\frac{1}{2}$.



Which point is the center of dilation?

A. (–4, 0)
B. (0, –4)
C. (0, 4)
D. (4, 0)

Note: Draw lines connecting corresponding points to determine the point of intersection (center of dilation).

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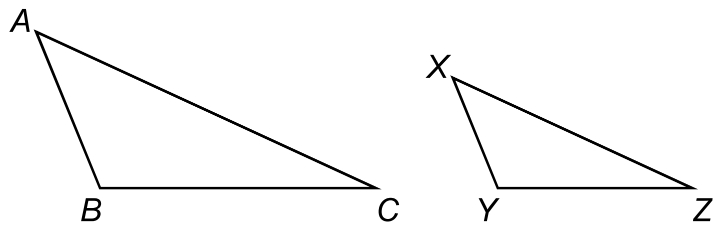
SAMPLE ITEMS

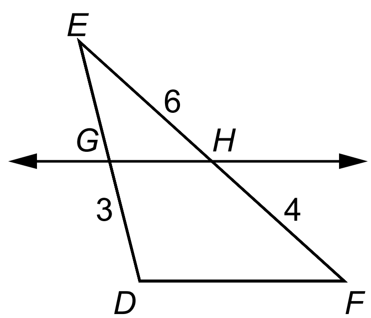
1. In the triangles shown, $\triangle ABC$ is dilated by a factor of $\frac{2}{3}$ to form $\triangle XYZ$.



Given that $m\angle A = 50°$ and $m\angle B = 100°$, what is $m\angle Z$?

A. 15°
B. 25°
C. 30°
D. 50°

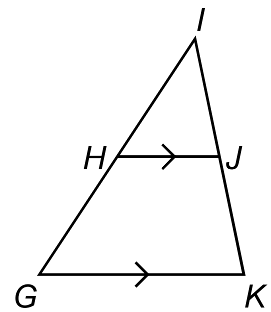
2. In the triangle shown, $\overleftrightarrow{GH} \parallel \overline{DF}$.



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

A. 2.0
B. 4.5
C. 7.5
D. 8.0

3. Use this triangle to answer the question.



This is a proof of the statement "If a line is parallel to one side of a triangle and intersects the other two sides at distinct points, then it separates these sides into segments of proportional lengths."

Step	Statement	Reason
1	$\overline{GK}$ is parallel to $\overline{HJ}$.	Given
2	$\angle IGK \cong \angle IHJ$ $\angle IKG \cong \angle IJH$	**?**
3	$\triangle GIK \sim \triangle HIJ$	AA Similarity
4	$\frac{IG}{IH} = \frac{IK}{IJ}$	Corresponding sides of similar triangles are proportional.
5	$\frac{HG + IH}{IH} = \frac{JK + IJ}{IJ}$	Segment Addition Postulate
6	$\frac{HG}{IH} = \frac{JK}{IJ}$	Subtraction Property of Equality

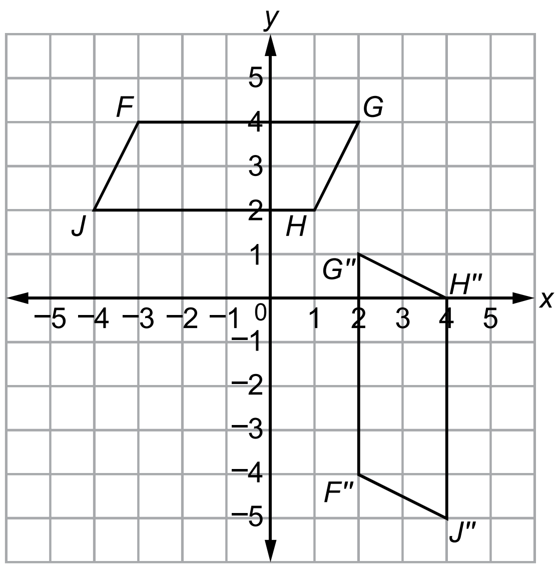
Which reason justifies Step 2?

A. Alternate interior angles are congruent.
B. Alternate exterior angles are congruent.
C. Corresponding angles are congruent.
D. Vertical angles are congruent.

[redacted]
[redacted] [redacted] [redacted]

SAMPLE ITEMS

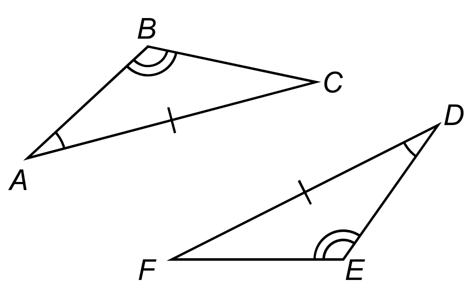
1. **Parallelogram *FGHJ* was translated 3 units down to form parallelogram *F′G′H′J′*. Parallelogram *F′G′H′J′* was then rotated 90° counterclockwise about point *G′* to obtain parallelogram *F″G″H″J″*.**



Which statement is true about parallelogram *FGHJ* and parallelogram *F″G″H″J″*?

A. The figures are both similar and congruent.
B. The figures are neither similar nor congruent.
C. The figures are similar but not congruent.
D. The figures are congruent but not similar.

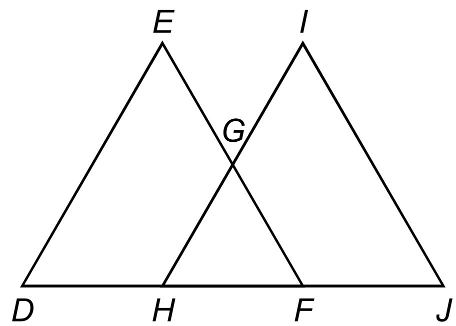
2. **Consider the triangles shown.**



Which can be used to prove the triangles are congruent?

A. SSS
B. ASA
C. SAS
D. AAS

3. In this diagram, $\overline{DE} \cong \overline{JI}$ and $\angle D \cong \angle J$.



Which additional information is sufficient to prove that $\triangle DEF$ is congruent to $\triangle JIH$?

A. $\overline{ED} \cong \overline{IH}$

B. $\overline{DH} \cong \overline{JF}$

C. $\overline{HG} \cong \overline{GI}$

D. $\overline{HF} \cong \overline{JF}$

[redacted]

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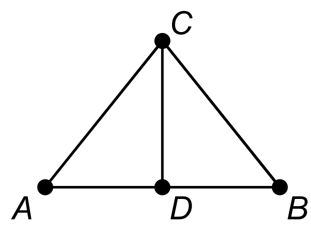
SAMPLE ITEMS

1. In this diagram, $\overline{CD}$ is the perpendicular bisector of $\overline{AB}$. The two-column proof shows that $\overline{AC}$ is congruent to $\overline{BC}$.

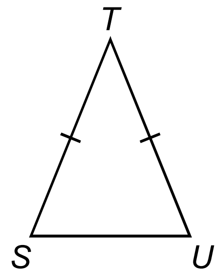


Step	Statement	Reason
1	$\overline{CD}$ is the perpendicular bisector of $\overline{AB}$.	Given
2	$\overline{AD} \cong \overline{BD}$	Definition of a bisector
3	$\overline{CD} \cong \overline{CD}$	Reflexive Property of Congruence
4	$\angle ADC$ and $\angle BDC$ are right angles.	Definition of perpendicular lines
5	$\angle ADC \cong \angle BDC$	All right angles are congruent.
6	$\triangle ADC \cong \triangle BDC$	**?**
7	$\overline{AC} \cong \overline{BC}$	CPCTC

Which of the following would justify Step 6?

A. AAS
B. ASA
C. SAS
D. SSS

2. In this diagram, *STU* is an isosceles triangle where $\overline{ST}$ is congruent to $\overline{UT}$. The two-column proof shows that $\angle S$ is congruent to $\angle U$.



Step	Statement	Reason
1	$\overline{ST} \cong \overline{UT}$	Given
2	Construct $\overline{TV}$, the angle bisector for $\angle T$, where V is on $\overline{SU}$.	Every angle has a bisector.
3	$\angle STV \cong \angle UTV$	Definition of an angle bisector
4	$\overline{TV} \cong \overline{TV}$	Reflexive Property of Congruence
5	$\triangle STV \cong \triangle UTV$	SAS
6	$\angle S \cong \angle U$	**?**

Which reason is missing in the proof?

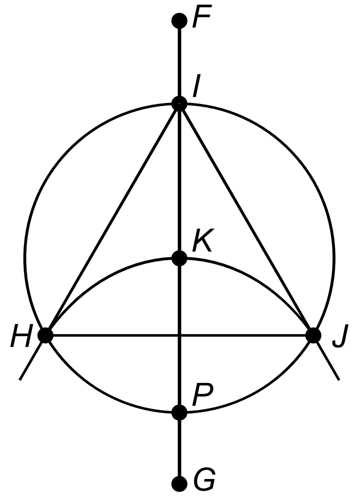
A. CPCTC
B. Reflexive Property of Congruence
C. Definition of right angles
D. Angle Congruence Postulate

[redacted]

- Construct equilateral $\triangle HIJ$ inscribed in circle K. Explain the steps you used to make your construction.

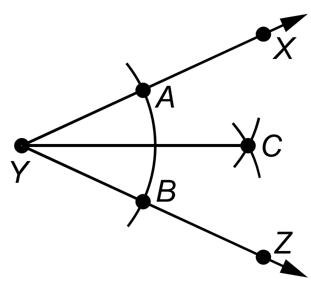
  Solution:

  (This is an alternate method from the method shown in the Key Ideas.) Use a compass to draw circle K. Draw segment $\overline{FG}$ through the center of circle K. Label the points where $\overline{FG}$ intersects circle K as points I and P. Using the compass setting you used when drawing the circle, place the compass on point P and draw an arc passing through point K. Label the points where the arc intersects circle K as points H and J. Draw $\overline{HJ}$, $\overline{IJ}$, and $\overline{HI}$. Triangle HIJ is an equilateral triangle inscribed in circle K.



SAMPLE ITEMS

1. Consider the construction of the angle bisector shown.

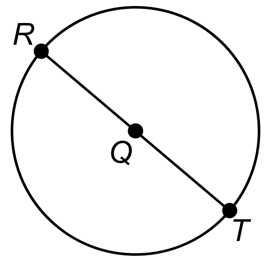


Which could have been the first step in creating this construction?

A. Place the compass point on point A and draw an arc inside $\angle Y$.
B. Place the compass point on point B and draw an arc inside $\angle Y$.
C. Place the compass point on vertex Y and draw an arc that intersects $\overline{YX}$ and $\overline{YZ}$.
D. Place the compass point on vertex Y and draw an arc that intersects point C.

2. Consider the beginning of the construction of a square inscribed in circle *Q*.

Step 1: Label point *R* on circle *Q*.
Step 2: Draw a diameter through *R* and *Q*.
Step 3: Label the point where the diameter intersects the circle as point *T*.



What is the next step in this construction?

A. Draw radius $\overline{SQ}$.
B. Label point *S* on circle *Q.*
C. Construct a line segment parallel to $\overline{RT}$.
D. Construct the perpendicular bisector of $\overline{RT}$.

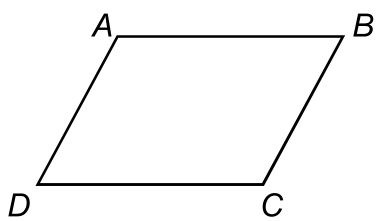
[redacted]

SAMPLE ITEMS

1. Which information is sufficient to show that a parallelogram is a rectangle?

A. The diagonals bisect each other.
B. The diagonals are congruent.
C. The diagonals are congruent and perpendicular.
D. The diagonals bisect each other and are perpendicular.

2. Look at quadrilateral *ABCD*.



Which information is needed to show that quadrilateral *ABCD* is a parallelogram?

A. Use the distance formula to show that diagonals *AC* and *BD* have the same length.
B. Use the slope formula to show that segments *AB* and *CD* are perpendicular and segments *AD* and *BC* are perpendicular.
C. Use the slope formula to show that segments *AB* and *CD* have the same slope and segments *AD* and *BC* have the same slope.
D. Use the distance formula to show that segments *AB* and *AD* have the same length and segments *CD* and *BC* have the same length.

[redacted]

SAMPLE ITEMS

1. **In right triangle *ABC*, angle *A* and angle *B* are complementary angles. The value of cos *A* is $\frac{5}{13}$.**

   What is the value of sin *B*?

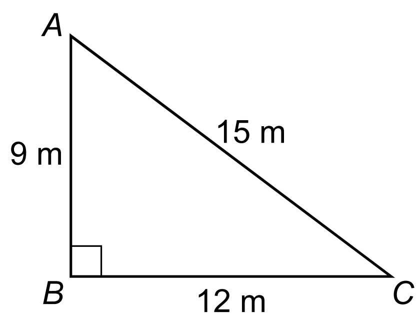
   A. $\frac{5}{13}$

   B. $\frac{12}{13}$

   C. $\frac{13}{12}$

   D. $\frac{13}{5}$

2. **Triangle *ABC* is given below.**



   What is the value of cos *A*?

   A. $\frac{3}{5}$

   B. $\frac{3}{4}$

   C. $\frac{4}{5}$

   D. $\frac{5}{3}$

3. In right triangle *HJK*, $\angle J$ is a right angle and tan $\angle H = 1$. Which statement about triangle *HJK* must be true?

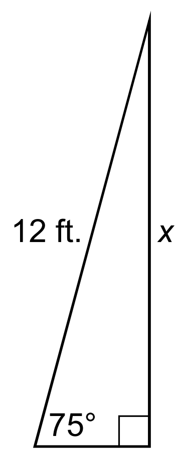
A. $\sin \angle H = \frac{1}{2}$

B. $\sin \angle H = 1$

C. $\sin \angle H = \cos \angle H$

D. $\sin \angle H = \frac{1}{\cos \angle H}$

4. A 12-foot ladder is leaning against a building at a 75° angle to the ground.



Which equation can be used to find how high the ladder reaches up the side of the building?

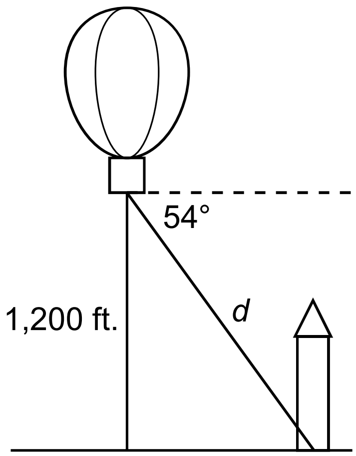
A. $\sin 75° = \frac{12}{x}$

B. $\tan 75° = \frac{12}{x}$

C. $\cos 75° = \frac{x}{12}$

D. $\sin 75° = \frac{x}{12}$

5. A hot-air balloon is 1,200 feet above the ground. The angle of depression from the basket of the hot-air balloon to the base of a monument is 54°.



Note: figure not drawn to scale.

Which equation can be used to find the distance, *d*, in feet, from the basket of the hot air balloon to the base of the monument?

A. $\sin 54° = \frac{d}{1200}$

B. $\sin 54° = \frac{1200}{d}$

C. $\cos 54° = \frac{d}{1200}$

D. $\cos 54° = \frac{1200}{d}$

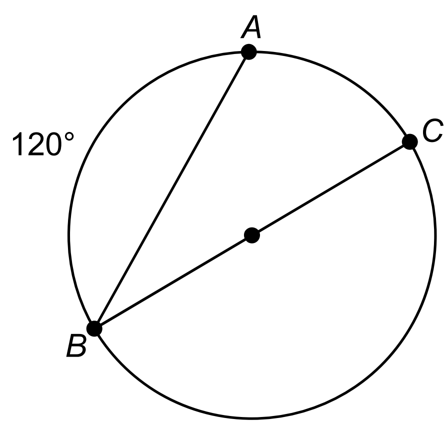
[redacted]

SAMPLE ITEMS

1. Circle *P* is dilated to form circle *P*′. Which statement is ALWAYS true?

A. The radius of circle *P* is equal to the radius of circle *P*′.
B. The length of any chord in circle *P* is greater than the length of any chord in circle *P*′.
C. The diameter of circle *P* is greater than the diameter of circle *P*′.
D. The ratio of the diameter to the circumference is the same for both circles.

2. In the circle shown, $\overline{BC}$ is a diameter and $m\widehat{AB} = 120°$.



What is the measure of $\angle ABC$?

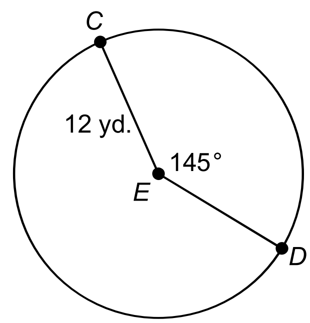
A. 15°
B. 30°
C. 60°
D. 120°

Answers to Unit 4.1 Sample Items

1. D   2. B

SAMPLE ITEMS

1. Circle *E* is shown.



What is the length of $\overset{\frown}{CD}$?

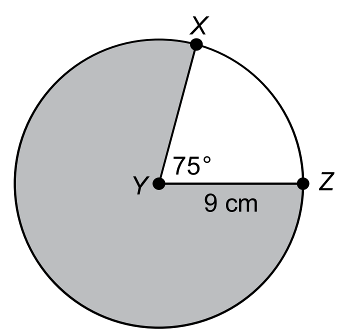
A. $\frac{29}{72}\pi$ yd.

B. $\frac{29}{6}\pi$ yd.

C. $\frac{29}{3}\pi$ yd.

D. $\frac{29}{2}\pi$ yd.

2. Circle *Y* is shown.



What is the area of the shaded part of the circle?

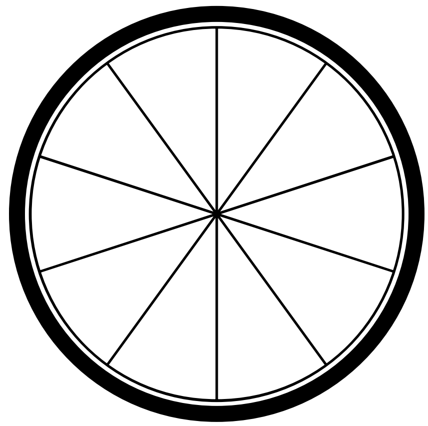
A. $\frac{57}{4}\pi\ \text{cm}^2$

B. $\frac{135}{8}\pi\ \text{cm}^2$

C. $\frac{405}{8}\pi\ \text{cm}^2$

D. $\frac{513}{8}\pi\ \text{cm}^2$

3. The spokes of a bicycle wheel form 10 congruent central angles. The diameter of the circle formed by the outer edge of the wheel is 18 inches.



What is the length, to the nearest tenth inch, of the outer edge of the wheel between two consecutive spokes?

A. 1.8 inches
B. 5.7 inches
C. 11.3 inches
D. 25.4 inches

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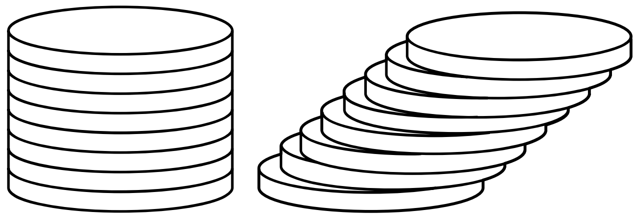
SAMPLE ITEMS

1. Jason constructed two cylinders using solid metal washers. The cylinders have the same height, but one of the cylinders is slanted as shown.



Which statement is true about Jason's cylinders?

A. The cylinders have different volumes because they have different radii.
B. The cylinders have different volumes because they have different surface areas.
C. The cylinders have the same volume because the washers are solid.
D. The cylinders have the same volume because they have the same cross-sectional area at every plane parallel to the bases.

2. What is the volume of a cylinder with a radius of 3 in. and a height of $\frac{9}{2}$ in.?

A. $\frac{81}{2}\pi$ in.^{3}
B. $\frac{27}{4}\pi$ in.^{3}
C. $\frac{27}{8}\pi$ in.^{3}
D. $\frac{9}{4}\pi$ in.^{3}

[redacted]

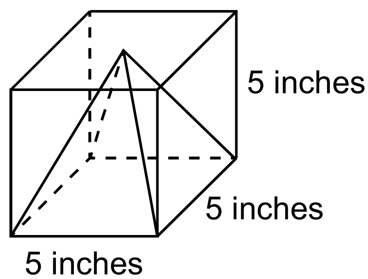
SAMPLE ITEMS

1. Joe counts 250 peach trees on 25% of the land he owns. He determines that there are 10 trees for every 1,000 square feet of land. About how many acres of land does Joe own?

1 acre = 43,560 square feet

A. 2.3
B. 10
C. 43.56
D. 2,500

2. A square pyramid is packaged inside a box.



The space inside the box around the pyramid is then filled with protective foam. About how many cubic inches of foam is needed to fill the space around the pyramid?

A. 8
B. 41
C. 83
D. 125

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SAMPLE ITEMS

1. Which is an equation for the circle with a center at (–2, 3) and a radius of 3?

A. $x^2 + y^2 + 4x - 6y + 22 = 0$
B. $2x^2 + 2y^2 + 3x - 3y + 4 = 0$
C. $x^2 + y^2 + 4x - 6y + 4 = 0$
D. $3x^2 + 3y^2 + 4x - 6y + 4 = 0$

2. What is the center of the circle given by the equation $x^2 + y^2 - 10x - 11 = 0$?

A. (5, 0)
B. (0, 5)
C. (–5, 0)
D. (0, –5)

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SAMPLE ITEMS

1. Which information is needed to show that a parallelogram is a rectangle?

A. The diagonals bisect each other.
B. The diagonals are congruent.
C. The diagonals are congruent and perpendicular.
D. The diagonals bisect each other and are perpendicular.

2. Which point is on a circle with a center of (3, –9) and a radius of 5?

A. (–6, 5)
B. (–1, 6)
C. (1, 6)
D. (6, –5)

3. Given the points *P*(2, –1) and *Q*(–9, –6), what are the coordinates of the point on directed line segment $\overline{PQ}$ that partitions $\overline{PQ}$ in the ratio $\frac{3}{2}$?

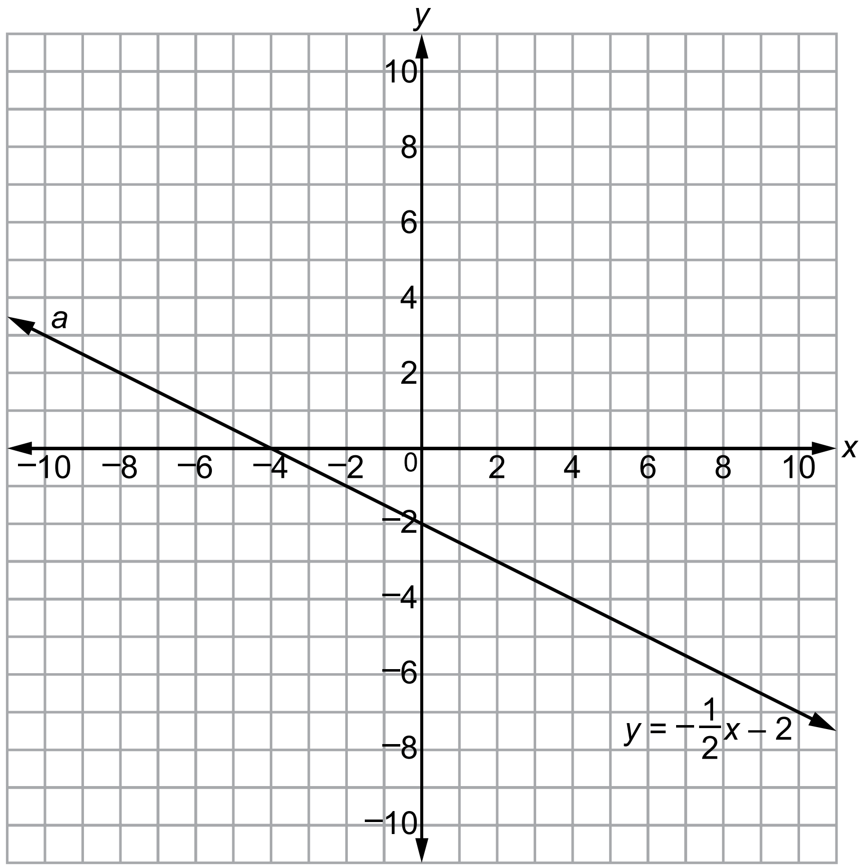
A. $\left(-\frac{23}{5}, -4\right)$

B. $\left(-\frac{12}{5}, -3\right)$

C. $\left(\frac{5}{3}, \frac{8}{3}\right)$

D. $\left(-\frac{5}{3}, -\frac{8}{3}\right)$

4. An equation of line *a* is $y = -\frac{1}{2}x - 2$.



Which equation is an equation of the line that is perpendicular to line *a* and passes through the point (–4, 0)?

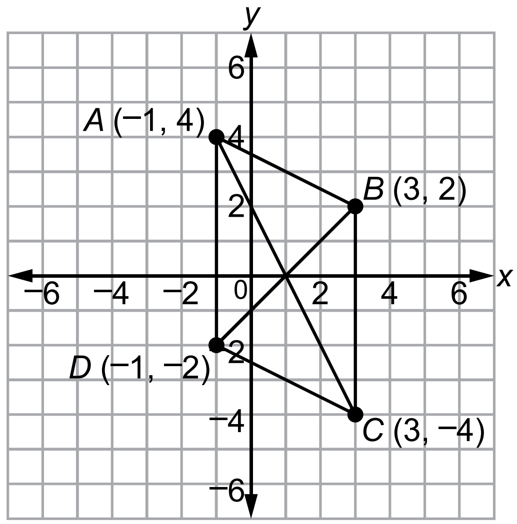
A. $y = -\frac{1}{2}x + 2$

B. $y = -\frac{1}{2}x + 8$

C. $y = 2x - 2$

D. $y = 2x + 8$

5. Parallelogram *ABCD* has vertices as shown.



Which equation would be used in proving that the diagonals of parallelogram *ABCD* bisect each other?

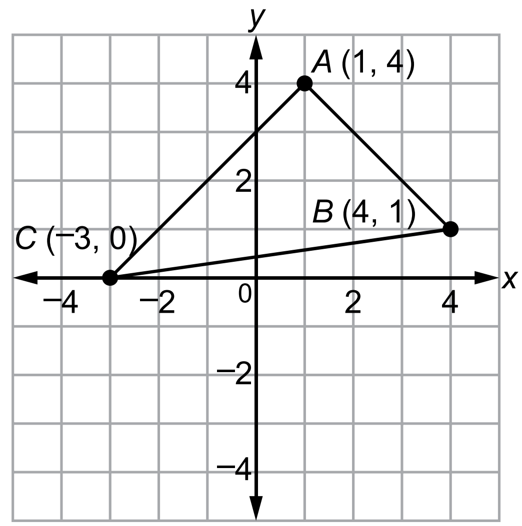
A. $\sqrt{(3-1)^2+(2-0)^2}=\sqrt{(1-3)^2+(0+4)^2}$

B. $\sqrt{(3+1)^2+(2+0)^2}=\sqrt{(1+3)^2+(0-4)^2}$

C. $\sqrt{(-1-1)^2+(4-0)^2}=\sqrt{(1-3)^2+(0+4)^2}$

D. $\sqrt{(-1+1)^2+(4+0)^2}=\sqrt{(1+3)^2+(0-4)^2}$

6. Triangle *ABC* has vertices as shown.



What is the area of the triangle?

A. $\sqrt{72}$ square units

B. 12 square units

C. $\sqrt{288}$ square units

D. 24 square units

[redacted]

[redacted] [redacted] [redacted] [redacted] [redacted] [redacted]

SAMPLE ITEMS

1. In a particular state, the first character on a license plate is always a letter. The last character is always a digit from 0 to 9.

If *V* represents the set of all license plates beginning with a vowel and *O* represents the set of all license plates that end with an odd number, which license plate belongs to the set *V* and O′?

A. E23 PC8

B. MG4 3F5

C. AR8 8X9

D. P7M Z56

2. For which set of probabilities would events *A* and *B* be independent?

A. $P(A) = 0.25$; $P(B) = 0.25$; $P(A \text{ and } B) = 0.5$
B. $P(A) = 0.08$; $P(B) = 0.4$; $P(A \text{ and } B) = 0.12$
C. $P(A) = 0.16$; $P(B) = 0.24$; $P(A \text{ and } B) = 0.32$
D. $P(A) = 0.3$; $P(B) = 0.15$; $P(A \text{ and } B) = 0.045$

3. Assume that the following events are independent:

- The probability that a high school senior will go to college is 0.72.
- The probability that a high school senior will go to college and live on campus is 0.46.

What is the probability that a high school senior will live on campus given that the high school senior will go to college?

A. 0.26
B. 0.33
C. 0.57
D. 0.64

4. A random survey was conducted about gender and hair color. This table records the data.

Hair Color

	Brown	**Blond**	**Red**	**Total**
Male	548	876	82	1,506
Female	612	716	66	1,394
Total	1,160	1,592	148	2,900

What is the probability that a randomly selected person has blond hair given that the person selected is male?

A. 0.51
B. 0.55
C. 0.58
D. 0.63

[redacted]

[redacted] [redacted] [redacted] [redacted]

SAMPLE ITEMS

1. Mrs. Klein surveyed 240 men and 285 women about their vehicles. Of those surveyed, 155 men and 70 women said they own a red vehicle. If a person is chosen at random from those surveyed, what is the probability of choosing a woman or a person who does NOT own a red vehicle?

A. $\frac{14}{57}$

B. $\frac{71}{105}$

C. $\frac{74}{105}$

D. $\frac{88}{105}$

2. Bianca spins two spinners that have four equal sections numbered 1 through 4. If she spins a 4 on at least one spin, what is the probability that the sum of her two spins is an odd number?

A. $\frac{1}{4}$

B. $\frac{7}{16}$

C. $\frac{4}{7}$

D. $\frac{11}{16}$

3. Each letter of the alphabet is written on separate cards in red ink. The cards are placed in a container. Each letter of the alphabet is also written on separate cards in black ink. The cards are placed in the same container. What is the probability that a card randomly selected from the container has a letter written in black ink or the letter is A or Z?

A. $\frac{1}{2}$

B. $\frac{7}{13}$

C. $\frac{15}{26}$

D. $\frac{8}{13}$

[redacted]

[redacted] [redacted] [redacted]