

## Performance Task Circle Constructions Worksheet

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### Part 1: Building a Foundation

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#### What is the definition of a circle?

*Hint: Think about the properties of a circle.*

- A) A shape with four equal sides
- B) A set of points equidistant from a central point
- C) A polygon with three sides
- D) A line segment with two endpoints

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#### Which of the following are parts of a circle? (Select all that apply)

*Hint: Consider the components that make up a circle.*

- A) Radius

- B) Diameter
- C) Tangent
- D) Vertex

**Which of the following are parts of a circle? (Select all that apply)**

*Hint: Consider the components that define a circle.*

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**Describe the relationship between the diameter and the radius of a circle.**

*Hint: Think about how these two measurements are connected.*

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**Describe the relationship between the diameter and the radius of a circle.**

*Hint: Think about how the diameter is related to the radius.*

**What is the value of  $\pi$  (pi) approximately?**

*Hint: Think about the common approximation used in calculations.*

- A) 2.718
- B) 3.14159
- C) 1.618
- D) 0.577

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*Hint: Consider the commonly used approximation.*

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*Hint: Consider the commonly used approximation of pi.*

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- B) 3.14159

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## Part 2: comprehension and Application

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**If a circle has a radius of 5 cm, what is its diameter?**

*Hint: Remember the relationship between radius and diameter.*

- A) 5 cm
- B) 10 cm
- C) 15 cm
- D) 20 cm

**If a circle has a radius of 5 cm, what is its diameter?**

*Hint: Use the relationship between radius and diameter.*

- A) 5 cm
- B) 10 cm
- C) 15 cm
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**If a circle has a radius of 5 cm, what is its diameter?**

*Hint: Remember the relationship between radius and diameter.*

- A) 5 cm
- B) 10 cm
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- D) 20 cm

**Which statements about tangents are true? (Select all that apply)**

*Hint: Consider the properties of tangents in relation to circles.*

- A) A tangent touches the circle at exactly one point.
- B) A tangent is always parallel to the radius.
- C) A tangent is perpendicular to the radius at the point of contact.
- D) A tangent can intersect the circle at two points.

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**Explain why the angle in a semicircle is always a right angle.**

*Hint: Think about the properties of angles and circles.*

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*Hint: Think about the properties of angles in circles.*

**You are given a circle with a radius of 7 cm. What is the circumference of the circle? (Use  $\pi \approx 3.14$ )**

*Hint: Use the formula for circumference based on the radius.*

- A) 21.98 cm
- B) 43.96 cm
- C) 14 cm
- D) 28 cm

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**Which of the following constructions can be made using a compass and straightedge? (Select all that apply)**

*Hint: Think about the geometric constructions possible with these tools.*

- A) Drawing a circle with a given radius
- B) Construct a tangent from a point outside the circle
- C) Dividing a circle into three equal parts
- D) Finding the center of a given circle

**Which of the following constructions can be made using a compass and straightedge? (Select all that apply)**

*Hint: Think about the capabilities of these tools.*

- A) Drawing a circle with a given radius
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**Which of the following constructions can be made using a compass and straightedge? (Select all that apply)**

*Hint: Think about the capabilities of compass and straightedge constructions.*

- A) Drawing a circle with a given radius
- B) Construct a tangent from a point outside the circle
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**Describe the steps to construct a circle through three non-collinear points.**

*Hint: Think about the geometric principles involved.*

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### Part 3: Analysis, Evaluation, and Creation

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**If two chords in a circle are equal in length, what can be said about their distance from the center?**

*Hint: Consider the properties of chords in relation to the center of the circle.*

- A) They are at different distances from the center.
- B) They are equidistant from the center.
- C) One is closer to the center than the other.
- D) The distance cannot be determined.

**If two chords in a circle are equal in length, what can be said about their distance from the center?**

*Hint: Consider the properties of chords in circles.*

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- B) They are equidistant from the center.
- C) One is closer to the center than the other.
- D) The distance cannot be determined.

**Analyze the following statements and identify which are true regarding inscribed angles. (Select all that apply)**

*Hint: Think about the properties of inscribed angles.*

- A) An inscribed angle is half the measure of the central angle subtending the same arc.
- B) Inscribed angles subtending the same arc are equal.
- C) Inscribed angles can only be right angles.
- D) The inscribed angle theorem applies to all polygons.

**Analyze the following statements and identify which are true regarding inscribed angles. (Select all that apply)**

*Hint: Think about the properties of inscribed angles in relation to circles.*

- A) An inscribed angle is half the measure of the central angle subtending the same arc.
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**Compare and contrast the properties of a tangent and a secant line in relation to a circle.**

*Hint: Think about how these lines interact with the circle.*

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**Which of the following statements best evaluates the properties of cyclic quadrilaterals?**

*Hint: Consider the properties that define cyclic quadrilaterals.*

- A) All sides are equal.
- B) Opposite angles sum to 180 degrees.
- C) Diagonals are perpendicular.
- D) All angles are right angles.

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*Hint: Consider the properties that define cyclic quadrilaterals.*

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**Which of the following statements best evaluates the properties of cyclic quadrilaterals?**

*Hint: Consider the characteristics of cyclic quadrilaterals.*

- A) All sides are equal.
- B) Opposite angles sum to 180 degrees.
- C) Diagonals are perpendicular.
- D) All angles are right angles.

**Imagine you need to design a circular garden with a path that is tangent to the circle at one point. Which of the following elements would you include in your design plan? (Select all that apply)**

*Hint: Think about the elements necessary for your design.*

- A) Calculate the radius of the garden.
- B) Determine the point of tangency.
- C) Ensure the path is parallel to the radius.
- D) Design the path to intersect the circle at two points.

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**Imagine you need to design a circular garden with a path that is tangent to the circle at one point. Which of the following elements would you include in your design plan? (Select all that apply)**

*Hint: Consider the requirements for your garden design.*

- A) Calculate the radius of the garden.
- B) Determine the point of tangency.
- C) Ensure the path is parallel to the radius.

- D) Design the path to intersect the circle at two points.

**Propose a method to find the center of a given circle using only a compass and straightedge, and explain why your method works.**

*Hint: Think about the geometric principles involved.*

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*Hint: Think about the geometric principles involved in finding the center.*