Performance Task Circle Constructions Worksheet Questions and Answers PDF

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Part 1: Building a Foundation

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

> A circle is defined as a set of points that are equidistant from a central point.

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> A circle is defined as a set of points equidistant from a central point.

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

> The parts of a circle include the radius, diameter, and tangent.

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

Hint: Consider the components that define a circle.

- [ ] **A) Radius ✓**
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> The parts of a circle include the radius, diameter, and tangent.

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

Hint: Think about how these two measurements are connected.

The diameter is twice the length of the radius.

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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.

The diameter is twice the length of the radius.

What is the value of π (pi) approximately?

Hint: Think about the common approximation used in calculations.

◯ A) 2.718

- ◯ **B) 3.14159 ✓**
- ◯ C) 1.618
- ◯ D) 0.577

> The approximate value of π is 3.14159.

What is the value of π (pi) approximately?

Hint: Consider the commonly used approximation.

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> The value of π is approximately 3.14159.

Part 2: comprehension and Application

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

> The diameter is twice the radius, so it is 10 cm.

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

Hint: Use the relationship between radius and diameter.

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> The diameter is twice the radius, so it is 10 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.

> A tangent touches the circle at exactly one point and is perpendicular to the radius at that point.

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

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A tangent touches the circle at exactly one point and is perpendicular to the radius at that point.

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

Hint: Think about the properties of angles and circles.

The angle in a semicircle is always a right angle because it subtends a diameter.

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

Hint: Think about the properties of angles in circles.

The angle in a semicircle is always a right angle due to the inscribed angle theorem.

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

Hint: Think about the properties of angles in circles.

The angle in a semicircle is always a right angle due to the inscribed angle theorem.

You are given a circle with a radius of 7 cm. What is the circumference of the circle? (Use π ≈ 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

The circumference is approximately 43.96 cm.

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> The circumference is approximately 43.96 cm.

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 ✓**

> You can draw a circle, construct a tangent, divide a circle, and find the center using these tools.

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 ✓**
- [ ] **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 ✓**

> You can draw a circle, construct a tangent, and find the center using these tools.

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 ✓**
- [ ] **C) Dividing a circle into three equal parts ✓**
- [ ] **D) Finding the center of a given circle ✓**

> You can draw a circle, construct a tangent, and find the center using these tools.

Describe the steps to construct a circle through three non-collinear points.

Hint: Think about the geometric principles involved.

To construct a circle through three non-collinear points, you can find the circumcenter of the triangle formed by the points.

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Hint: Think about the geometric principles involved.

To construct a circle through three non-collinear points, you can find the circumcenter.

Part 3: Analysis, Evaluation, and Creation

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 are equal in length, they are equidistant from the center of the circle.

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.

- ◯ A) They are at different distances from the center.
- ◯ **B) They are equidistant from the center. ✓**
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- ◯ D) The distance cannot be determined.

> The two chords are equidistant from the center of the circle.

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.

> Inscribed angles are half the measure of the central angle subtending the same arc.

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. ✓**
- [ ] **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.

> Inscribed angles are half the measure of the central angle subtending the same arc, and angles subtending the same arc are equal.

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.

> Inscribed angles are half the measure of the central angle subtending the same arc.

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.

> **A tangent touches the circle at one point, while a secant intersects the circle at two points.**

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

A tangent touches the circle at one point, while a secant intersects the circle at two points.

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.

Opposite angles in cyclic quadrilaterals sum to 180 degrees.

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

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> In cyclic quadrilaterals, opposite angles sum to 180 degrees.

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

Hint: Consider the characteristics of cyclic quadrilaterals.

- ◯ A) All sides are equal.
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> In cyclic quadrilaterals, opposite angles sum to 180 degrees.

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.

> You would include calculations for the radius, the point of tangency, and the design of the path.

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.

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> You would include calculating the radius, determining the point of tangency, and ensuring the path is tangent to the circle.

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.

> You would need to calculate the radius, determine the point of tangency, and ensure the path is tangent.

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.

> **You can find the center by drawing two chords and finding their intersection.**

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> **You can find the center by drawing two chords and finding their intersection.**

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 in finding the center.

To find the center, draw two chords and find their intersection point, which will be the center of the circle.