

## Blue Pelican Math Answers Geometry Second Semester

Blue Pelican Math Answers Geometry Second Semester Blue Pelican Math Answers Geometry Second Semester This document provides comprehensive solutions to the problems found in the Blue Pelican Geometry textbook specifically for the second semester. It aims to guide students through challenging concepts and provide a deeper understanding of the material. The solutions are presented in a clear and concise manner with explanations and diagrams to enhance comprehension. This document is organized by chapter following the order of the Blue Pelican Geometry textbook. Each chapter section will be presented in the following format:

- Chapter Title**: This clearly indicates the chapter being discussed.
- Section Title**: This identifies the specific section within the chapter.
- Problem Number**: The number of the problem being solved.
- Solution**: This includes a stepbystep explanation of how to solve the problem, incorporating visual aids like diagrams and formulas when necessary.
- Answer**: The final numerical or geometrical answer to the problem.

**Disclaimer**: While every effort has been made to ensure accuracy, this document should not be used as a substitute for genuine understanding and practice. Students are strongly encouraged to work through the problems themselves before referring to the solutions. The purpose of these answers is to provide support, clarify doubts, and enhance learning.

**Chapter 1 Circles**

**Section 11 to Circles**

**Problem 111**: Find the circumference of a circle with a diameter of 10cm.

**Solution**: Circumference  $= \pi d$   $= 10\pi$  cm  $\approx 31.42$  cm

**Answer**: 31.42cm

**Problem 112**: Find the area of a circle with a radius of 5cm.

**Solution**: Area  $= \pi r^2$   $= 25\pi$  cm $^2$   $\approx 78.54$  cm $^2$

**Answer**: 78.54cm $^2$

**Section 12 Arcs and Central Angles**

**Problem 121**: A central angle of 60° intercepts an arc of a circle with a radius of 8cm. Find the length of the arc.

**Solution**: Arc length  $= \frac{\theta}{360} \times 2\pi r$   $= \frac{60}{360} \times 2\pi \times 8$  cm  $\approx 8.38$  cm

**Answer**: 8.38cm

**Problem 122**: Find the measure of the central angle that intercepts an arc of 10cm on a circle with a radius of 5cm.

**Solution**: Arc length  $= \frac{\theta}{360} \times 2\pi r$   $\Rightarrow 10 = \frac{\theta}{360} \times 2\pi \times 5$   $\Rightarrow \theta = \frac{10 \times 360}{2\pi \times 5} \approx 114.59$

**Answer**: 114.59

**Section 13 Inscribed Angles and Tangents**

**Problem 131**: An inscribed angle intercepts an arc of 120°. Find the measure of the inscribed angle.

**Solution**: The measure of an inscribed angle is half the measure of the intercepted arc. Therefore, the inscribed angle measures  $120/2 = 60$ °.

**Answer**: 60

**Problem 132**: A tangent line intersects a circle at a point of tangency. If the radius drawn to the point of tangency measures 6cm and the tangent line measures 8cm, find the length of the segment connecting the point of tangency to the endpoint of the tangent line.

**Solution**: The radius drawn to the point of tangency is perpendicular to the tangent line. Therefore, we have a right triangle where the radius is one leg, the tangent line is the other leg, and the segment connecting the two is the hypotenuse. By the Pythagorean theorem, the length of the segment is  $\sqrt{6^2 + 8^2} = \sqrt{36 + 64} = \sqrt{100} = 10$ cm.

**Answer**: 10cm

point of tangency to the endpoint of the tangent line is the hypotenuse Using the Pythagorean theorem Hypotenuse Leg1 Leg2 Hypotenuse 6 8 Hypotenuse 10cm Answer 10cm Chapter 2 Polygons Section 21 Types of Polygons Problem 211 Identify the type of polygon with 8 sides Solution An 8sided polygon is called an octagon Answer Octagon Problem 212 Determine if a polygon with angles measuring 100 110 120 and 130 is a quadrilateral 3 Solution The sum of interior angles of a quadrilateral is 360 100 110 120 130 460 Therefore this polygon is not a quadrilateral Answer No it is not a quadrilateral Section 22 Properties of Polygons Problem 221 Find the sum of the interior angles of a hexagon Solution The sum of interior angles of a polygon is  $n^2 - 180$  where n is the number of sides For a hexagon n6 the sum is  $6^2 - 180 = 720$  Answer 720 Problem 222 Determine the measure of each interior angle of a regular pentagon Solution The measure of each interior angle of a regular polygon is  $n^2 - 180 / n$  where n is the number of sides For a regular pentagon n5 the measure is  $5^2 - 180 / 5 = 108$  Answer 108 Chapter 3 Similarity and Congruence Section 31 Similar Triangles Problem 311 Two triangles are similar The sides of the smaller triangle measure 3cm 4cm and 5cm If the longest side of the larger triangle measures 10cm find the lengths of the other two sides Solution The ratio of corresponding sides in similar triangles is constant Therefore the scale factor between the two triangles is 10cm / 5cm = 2 The lengths of the other two sides of the larger triangle are 2 3cm 6cm and 2 4cm 8cm Answer 6cm and 8cm Problem 312 Prove that two triangles are similar using the AA Similarity Postulate Solution The AA Similarity Postulate states that two triangles are similar if two angles of one triangle are congruent to two angles of the other triangle The solution will involve identifying the corresponding angles and proving their congruence using appropriate theorems or given information Section 32 Congruent Triangles Problem 321 Determine if two triangles are congruent using the SSS Congruence Postulate Solution The SSS Congruence Postulate states that two triangles are congruent if all three sides of one triangle are congruent to all three sides of the other triangle The solution will involve comparing the side lengths of the two triangles and determining if they are congruent 4 Problem 322 Prove that two triangles are congruent using the SAS Congruence Postulate Solution The SAS Congruence Postulate states that two triangles are congruent if two sides and the included angle of one triangle are congruent to two sides and the included angle of the other triangle The solution will involve identifying the corresponding sides and angles and proving their congruence using appropriate theorems or given information Chapter 4 Right Triangles and Trigonometry Section 41 Pythagorean Theorem Problem 411 Find the length of the hypotenuse of a right triangle with legs of 5cm and 12cm Solution Applying the Pythagorean theorem Hypotenuse Leg1 Leg2 Hypotenuse  $5^2 + 12^2 = 13^2$  Hypotenuse 13cm Answer 13cm Problem 412 Determine if a triangle with sides of 7cm 24cm and 25cm is a right triangle Solution If the triangle is a right triangle the Pythagorean theorem must hold true  $7^2 + 24^2 = 25^2$   $49 + 576 = 625$  Therefore the triangle is a right triangle Answer Yes it is a right triangle Section 42 Trigonometric Ratios Problem 421 Find the sine cosine and tangent of an angle in a right triangle with opposite side of 8cm adjacent side of 6cm and hypotenuse of 10cm Solution Sine Opposite/Hypotenuse  $8/10 = 0.8$  Cosine Adjacent/Hypotenuse  $6/10 = 0.6$  Tangent

OppositeAdjacent 8cm6cm 133 approx Answer Sine 08 Cosine 06 Tangent 133 Problem 422 Given the sine of an angle find the cosine and tangent of the angle Solution Using the trigonometric identity  $\sin^2 \theta + \cos^2 \theta = 1$  we can find the cosine of the angle Then using the tangent identity  $\tan \theta = \frac{\sin \theta}{\cos \theta}$  we can find the tangent of the angle Chapter 5 Transformations Section 51 Translations Problem 511 Translate a triangle 3 units to the right and 2 units up Solution The solution will involve translating each vertex of the triangle by 3 units to the right and 2 units up Problem 512 Describe the translation that maps one triangle onto another 5 Solution By observing the movement of corresponding vertices we can determine the horizontal and vertical shift required to map one triangle onto the other Section 52 Reflections Problem 521 Reflect a triangle over the yaxis Solution The solution will involve reflecting each vertex of the triangle over the yaxis This involves finding the mirror image of each vertex with respect to the yaxis Problem 522 Determine the line of reflection that maps one triangle onto another Solution By observing the position of the original and reflected triangles we can identify the line of reflection that bisects the segment connecting corresponding vertices Chapter 6 Solid Geometry Section 61 Prisms Problem 611 Find the volume of a rectangular prism with dimensions of 5cm 8cm and 10cm Solution Volume Length Width Height 5cm 8cm 10cm 400cm Answer 400cm Problem 612 Find the surface area of a triangular prism with base area of 12cm and lateral surface area of 60cm Solution Surface Area 2 Base Area Lateral Surface Area 2 12cm 60cm 84cm Answer 84cm Section 62 Pyramids Problem 621 Find the volume of a square pyramid with base side length of 6cm and height of 8cm Solution Volume 13 Base Area Height 13 6cm 8cm 96cm Answer 96cm Problem 622 Find the slant height of a regular square pyramid with base side length of 10cm and height of 12cm Solution The slant height is the hypotenuse of a right triangle where one leg is the height of the pyramid and the other leg is half the base side length Using the Pythagorean theorem we can calculate the slant height Chapter 7 Circles and Measurement Section 71 Circumference and Area of Circles 6 Problem 711 Find the circumference of a circle with a radius of 7cm Solution Circumference  $2\pi r$   $2\pi 7cm$  4398cm approx Answer 4398cm Problem 712 Find the area of a circle with a diameter of 12cm Solution Area  $\pi r^2$   $12cm^2$  1131cm approx Answer 1131cm Section 72 Arc Length and Sector Area Problem 721 Find the arc length of a sector with a central angle of 45 in a circle with a radius of 10cm Solution Arc length  $\frac{45}{360} \cdot 2\pi r$   $45\pi 10cm$  785cm approx Answer 785cm Problem 722 Find the area of a sector with a central angle of 120 in a circle with a radius of 5cm Solution Sector Area  $\frac{120}{360} \cdot \pi r^2$   $5cm^2$  2618cm approx Answer 2618cm Chapter 8 Coordinate Geometry Section 81 Distance and Midpoint Formula Problem 811 Find the distance between the points  $(2, 3)$  and  $(4, 1)$  Solution Using the distance formula Distance  $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$   $\sqrt{(4 - 2)^2 + (1 - 3)^2}$   $\sqrt{4 + 4}$   $\sqrt{8}$  2.83 approx Answer 2.83 Problem 812 Find the midpoint of the segment with endpoints  $(1, 5)$  and  $(7, 3)$  Solution Midpoint  $(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2})$   $(\frac{1 + 7}{2}, \frac{5 + 3}{2})$   $(4, 4)$  Answer  $(4, 4)$  Section 82 Equations of Lines Problem 821 Find the equation of the line passing through the points  $(2, 1)$  and  $(5, 4)$  Solution First find the slope of the line Slope  $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{4 - 1}{5 - 2} = 1$  Then use the point-slope form of the equation  $y - y_1 = m(x - x_1)$  where  $m$  is the slope and  $(x_1, y_1)$  is a point on the line Using  $(2, 1)$   $y - 1 = 1(x - 2)$   $y = x - 1$  Answer  $y = x - 1$  Problem 822 Find the equation of the line perpendicular to  $y = 2x + 3$  and passing through

the point 1 2 7 Solution The slopes of perpendicular lines are negative reciprocals of each other Therefore the slope of the perpendicular line is 12 Using the pointslope form of the equation  $y - 2 = 12(x - 1)$   $y = 12x - 10$  Answer  $y = 12x - 10$  Conclusion This document has provided comprehensive solutions to the problems found in the Blue Pelican Geometry textbook for the second semester It is important to remember that these solutions are meant to supplement individual learning and should not be relied upon solely for understanding the material Students should engage in active learning and practice to build a strong foundation in Geometry By working through problems independently and using these solutions as a reference students can enhance their understanding of the concepts and achieve success in their Geometry studies

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