Practice Questions for Triangles:

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| Question | Triangle ABC, shown below, has an area of 15 mm2. Side AC has a length of 6 mm and side AB has a length of 8 mm and angle BAC is obtuse. Find angle BAC to the and find length of side BC.  triangle inscribed in square |
| Option A | 13 |
| Option B | 13.23 |
| Option C | 14 |
| Option D | 14.25 |
| Answer | Option B |
| Explanation | Let the size of angle BAC = t. One of the many formulas for the [area triangle](http://www.analyzemath.com/Geometry/formulas/table_formulas_geometry.html#area_2) is.   area = 15 = (1/2) (AC)(AB) sin(t)  Solve for sin(t) to obtain.   sin(t) = 30 / (8\*6) = 0.625  Solve for t above and take the solution that gives t obtuse   t = Pi - arcsin(0.625)  Convert t to degrees to obtain   t (approximately) = 141.3 o  We now use the [cosine rule](http://www.analyzemath.com/Geometry/triangles.html#cosine_rule) to calculate the length of side BC   BC2 = AB2 + AC2 - 2(AB)(AC)cos(t)   = 64 + 36 - 2(8)(6)cos(141.3o)   BC = 13.23 mm. |

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| Question | [image]  Find the Missing Angle "C" |
| Option A | 65 |
| Option B | 75 |
| Option C | 135 |
| Option D | 85 |
| Answer | Option B |
| Explanation | |  | | --- | | A + B + C = 180° | |  |  |  | | Fill in what we know: |  | 39° + 66° + C = 180° | |  |  |  | | Rearrange |  | C = 180° - 39° - 66° | |  |  |  | | Calculate: |  | C = 75° | |

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| Question | Let A,B and C be the vertices of the equilateral triangle and M the midpoint of segment BC. The triangle is equilateral, AMC is a right triangle. find h the height of the triangle .  triangle inscribed in square |
| Option A | 5 |
| Option B | 10 |
| Option C | 10 |
| Option D | 5 |
| Answer | Option D |
| Explanation | h2 + 52 = 102  h = 5 |

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| Question | An isosceles triangle has angle A 30 degrees greater than angle B. Find all angles of the triangle |
| Option A | 80, 30, 30 |
| Option B | 80, 50, 50 |
| Option C | 60, 60, 60 |
| Option D | 120, 30, 30 |
| Answer | Option B |
| Explanation | An isosceles triangle has two angles equal in size. In this problem A is greater than B therefore angles B and C are equal in size. Since angle A is 30 greater than angle B then A = B + 30o. The sum of all angles in a triangle is equal to 180 o.  (B+30) + B + B = 180  By solving the equation for B B = 50 o  The sizes of the three angles are   A = B + 30 = 80 o   C = B = 50 o |

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| Question | Triangle ABC, shown below, has an area of 15 mm 2. Side AC has a length of 6 mm and side AB has a length of 8 mm and angle BAC is obtuse. Find angle BAC to the and find length of side BC.  triangle inscribed in square |
| Option A | 145 |
| Option B | 141.3 |
| Option C | 150 |
| Option D | 155 |
| Answer | Option B |
| Explanation | Let the size of angle BAC = t. One of the many formulas for the [area triangle](http://www.analyzemath.com/Geometry/formulas/table_formulas_geometry.html#area_2)is.   area = 15 = (1/2) (AC)(AB) sin(t)  Solve for sin(t) to obtain.   sin(t) = 30 / (8\*6) = 0.625  Solve for t above and take the solution that gives t obtuse   t = Pi - arcsin(0.625)  Convert t to degrees to obtain   t (approximately) = 141.3 o |

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| Question | Find the value of x ?  Figure 1 |
| Option A | 6 |
| Option B | 7 |
| Option C | 8 |
| Option D | 9 |
| Answer | Option A |
| Explanation | The two triangles are similar triangles since they share two sets of common angles. Particularly, both triangles have a 90 degree angle and a 20 degree angle.  The ratio of the corresponding sides of the similar triangles is 14/7 = 2.  To determine x, set up a ratio of the sides' length since one property of common triangles is that their corresponding sides have the same ratio. x/3 = 14/7 = 2 x=6 |

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| Question | What is the radius of the incircle of the triangle whose sides measure 5, 12 and 13 units? |
| Option A | 2 units |
| Option B | 12 units |
| Option C | 6.5 units |
| Option D | 6 units |
| Answer | Option A |
| Explanation | The triangle given is a right angled triangle as its sides are 5, 12 and 13 which is one of the Pythagorean triplets.  **Note:**  In a right angled triangle, the radius of the incircle is given by the following relation   (Sum of perpendicular sides – Hypotenus)/2  As the given triangle is a right angled triangle, radius of its incircle = (5+12-13)/2 = 2 units. |

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| Question | What is the area of an obtuse angled triangle whose two sides are 8 and 12 and the angle included between two sides is 1500? |
| Option A | 24 sq units |
| Option B | 48 sq units |
| Option C | 24 sq units |
| Option D | 48 sq units |
| Answer | Option A |
| Explanation | If two sides of a triangle and the included angle 'y' is known, then the area of the triangle can be found using the formula  ½ X (Product of Sides) X Sin Y  Substituting the values in the formula, we get ½ X 8 X 12 X Sin 150  = 24 sq units |

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| Question | If 10, 12 and 'x' are sides of an acute angled triangle, how many integer values of 'x' are possible? |
| Option A | 7 |
| Option B | 12 |
| Option C | 9 |
| Option D | 13 |
| Answer | Option C |
| Explanation | Finding the answer to this question requires one to know two rules in geometry. **Rule 1:** For an acute angled triangle, the square of the LONGEST side MUST BE LESS than the sum of squares of the other two sides.  **Rule 2:** For any triangle, sum of any two sides must be greater than the third side. The sides are 10, 12 and 'x'. From Rule 2, x can take the following values: 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21 – A total of 19 values.  When x = 3 or x = 4 or x = 5 or x = 6, the triangle is an OBTUSE angled triangle (Rule 1 is NOT satisfied). The smallest value of x that satisfies BOTH conditions is 7. (102 + 72 > 122). The highest value of x that satisfies BOTH conditions is 15. (102 + 122 > 152). When x = 16 or x = 17 or x = 18 or x = 19 or x = 20 or x = 21, the triangle is an OBTUSE angled triangle (Rule 1 is NOT satisfied). Hence, the values of x that satisfy both the rules are x = 7, 8, 9, 10, 11, 12, 13, 14, 15. A total of 9 values. |
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| Question | [image] The area of the triangle is 22.5 units2 What is the length of the base of the triangle? |
| Option A | 6 |
| Option B | 7 |
| Option C | 8 |
| Option D | 9 |
| Answer | Option D |
| Explanation | Use Area = ½bh We know the area is 22.5 units2 and the height h = 5 area = ½bh ⇒ 22.5 = ½ × b × 5 Multiply both sides by 2: ⇒ 45 = b × 5 ⇒ b = 45 ÷ 5 = 9 |

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| Question | [image] What is the size of the missing angle a°? |
| Option A | 53.6° |
| Option B | 71.8° |
| Option C | 72.7° |
| Option D | 143.6° |
| Answer | Option B |
| Explanation | The triangle has two equal sides of length 6 units, so it is isosceles. So the two angles marked a° must be equal.  All three angles in a triangle must add to 180° So:   36.4° + a° + a° = 180° Then: 36.4 + 2a  = 180  Rearrange: 2a = 180 − 36.4 = 143.6  Divide by 2: 1 = 143.6 ÷ 2 = 71.8 |

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| Question | ***vertical pole of length 6m a shadow of 4m long on the ground. At the same time a tower cast a shadow 28m long. Find the height of the tower.*** |
| Option A | 42 |
| Option B | 6/7 |
| Option C | 36 |
| Option D | 49 |
| Answer | Option A |
| Explanation | The pole of 6 meters corresponds to the height of the tower. The shadow of the pole, 4 meter shadow, corresponds to the 28 meter shadow of the tower.  h is tower's height; 6/h = 4/28 or 6/h = 1/7  Or h = 42 meter |

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| Question | A ladder of length 2x+1 feet is positioned against a wall such that the bottom is x−1 feet away from a wall. The distance between the floor and the top of the ladder is 2x feet.  Find the length, in feet, of the ladder.  Assume that a right angle is formed by the wall and the floor. |
| Option A | 10 feet |
| Option B | 6 feet |
| Option C | 12 feet |
| Option D | 18 feet |
| Answer | Option C |
| Explanation | By Pythagoras theorem  (x-1)^2+(2x)^2=(2x+1)^2  x^2-2x+1 +4x^2=4x^2+4x+1  x^2-6x=0  x(x-6)=0  x=0 OR 6  length of ladder = 6\*2 = 12 feet |

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| Question | ***One side of triangle is 5 more than 2 times the shortest side. The third side is 25 centimeters more than the shortest side. The perimeter is 74. Find all three sides.*** |
| Option A | 27, 11, 36 |
| Option B | 22, 11, 33 |
| Option C | 20, 10, 30 |
| Option D | 11, 35, 46 |
| Answer | Option A |
| Explanation | Let x,y,z be the sides of triangle and y being the shortest side  According to the problem, perimater = 74 x%2By%2Bz=74……….(1) Also, x=2y%2B5…….. (2) z=y%2B25……….(3) Substitute for x and z in first equation to get x,y, z value  2y + 5 + y + y +25 = 74  Or 4y + 30 = 74  Or 4y = 44  Or y = 11  By equation (2) and (3)  x = 22 + 5 = 27  z = 11 + 25 = 36 |

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| Question | *The vertex angle of an isosceles triangle is 92 degrees. find the measure of each base angle* |
| Option A | 92 |
| Option B | 42 |
| Option C | 88 |
| Option D | 44 |
| Answer | Option D |
| Explanation | **B = base angle ---- B + B + 92 = 180**  Or 2B = 88  Or B = 44 |