

Name: Key Quarter 3, Exam 2 Study Guide

1. Directions: Solve for x . Round to the nearest tenth, if necessary.

a. $\sin^{-1}\left(\frac{11}{8}\sin 100^\circ\right)$
 $\frac{11}{8} = \frac{\sin x}{\sin 100^\circ}$
 $8 \sin 100^\circ = 11 \sin x$
 $8 \sin 100^\circ = 11 \sin x$
 $8 \cdot 0.9848 = 11 \sin x$
 $7.8784 = 11 \sin x$
 $0.7162 = \sin x$
 $x = 44.6^\circ$

b. $x \approx 8.7$
 $\frac{16}{95} = \frac{\sin 30^\circ}{\sin x}$
 $16 \sin 30^\circ = 95 \sin x$
 $16 \cdot 0.5 = 95 \sin x$
 $8 = 95 \sin x$
 $\frac{8}{95} = \sin x$
 $0.0842 = \sin x$
 $x = 4.8^\circ$

2. In scalene triangle ABC shown in the diagram below, $m\angle C = 90^\circ$.

 $15^2 = 13^2 + 17.8^2 - 2(13)(17.8)\cos x$
 $225 = 169 + 316.44 - 463.2 \cos x$
 $225 = 484.44 - 463.2 \cos x$
 $-259.44 = -463.2 \cos x$
 $\frac{-259.44}{-463.2} = \frac{-259.44}{-463.2} \cos x$
 $0.56 = \cos x$
 $x = 55.9^\circ$

Which equation is always true?
 1) $\sin A = \sin B$
 2) $\cos A = \cos B$
 3) $\cos A = \sin C$
 4) $\sin A = \cos B$

3. If $\sin(\theta + 30^\circ) = \cos \theta$, the value of x is
 1) 35°
 2) 45°
 3) 55°
 4) 70°

4. In right triangle ABC with the right angle at C , $\sin A = 2/3$ and $\cos B = 4/5$. Determine and state the value of x .
 $\sin A = \cos B$
 $2x + 1 = 7x - 7$
 $1 = 2x - 7$
 $8 = 2x$
 $x = 4$

5. In parallelogram $CDEF$, $CD = 5x - 8$ and $FE = 3x + 10$. Find the value of x .

 $5x - 8 = 3x + 10$
 $2x = 18$
 $x = 9$

6. In parallelogram $ABCD$, the measures of angles A and B are in the ratio of 2:7. Find $m\angle B$.

 $2x + 7x = 180$
 $9x = 180$
 $x = 20$
 $4B = 7(20) = 140$

7. Which statement is always true?
 (1) The diagonals of a parallelogram are perpendicular to each other.
 (2) The diagonals of a parallelogram bisect each other.
 (3) The diagonals of a parallelogram bisect the angles of the parallelogram.
 (4) The diagonals of a parallelogram are congruent.

10. In the accompanying diagram, AC is a diagonal of $ABCD$. If $m\angle CAB = 35^\circ$, find $m\angle CDB$.

 $90 + 35 + x = 180$
 $125 + x = 180$
 $x = 55$
 $m\angle CDB = 55$

11. In the diagram below, $ABDE$ is a parallelogram. \overline{ED} is \overline{DE} . If $m\angle E = 100^\circ$, find $m\angle ADC$.

 $m\angle BDC = 30^\circ$

12. If quadrilateral $ABCD$ is a parallelogram, which statement must be true?
 1) $\overline{AC} \perp \overline{BD}$
 2) $\overline{AC} \perp \overline{AD}$
 3) \overline{AC} bisects $\angle DAB$ and $\angle BCD$
 4) \overline{AC} and \overline{BD} bisect each other.

13. If an exterior angle in a regular polygon is 40° , find the number of sides of the polygon. Each ext $\angle = \frac{360}{n}$
 $40 = \frac{360}{n}$
 $40n = 360$
 $n = 9$

14. If $ABCD$ is an isosceles trapezoid, $\overline{AD} \cong \overline{BC}$, $\overline{AB} \parallel \overline{DC}$, $\overline{AC} \cong \overline{BD}$, $\overline{AC} \perp \overline{BD}$, and $\overline{AD} \cong \overline{BC}$. Find x and y .

 Legs are \cong
 $16x - 13 = 9x + 8$
 $7x = 21$
 $x = 3$
 Diag are \cong
 $5y + 19 = 12y - 37$
 $-7y = -56$
 $y = 8$

13. Complete the table below. Round to the nearest tenth when necessary.

# of sides of	SUM of the interior angles	Measure of EACH interior angle	SUM of the exterior angles	Measure of EACH exterior angle
4 - regular convex polygon	$180(n-2)$	$\frac{180(n-2)}{n}$	360	$\frac{360}{n}$
5 - Pentagon	$180(5-2)$ 540	$\frac{540}{5} = 108$	360	$\frac{360}{5} = 72$
18 - gon	$180(18-2)$ 2970	$\frac{2970}{18} = 165$	360	$\frac{360}{18} = 20$
21 - gon	$180(21-2)$ 3780	$\frac{3780}{21} = 180$	360	$\frac{360}{21} \approx 17$

14. Find $m\angle B$.

 $12x + 3 + 7x - 13 = 180$
 $19x - 10 = 180$
 $19x = 190$
 $x = 10$
 $4R = 7(10) - 13 = 57$

15. Find RS .

 $2x + 5 + 6x - 37 = 3x + 5$
 $8x - 32 = 3x + 5$
 $5x = 37$
 $x = 7.4$
 $RS = 2x + 5 = 2(16) + 5 = 37$

- co-functions
- law of Sines
- law of cosines
- Polygons (Sum int. \angle 's, each int. \angle , (reg polygon)
Sum ext \angle , each ext \angle (reg polygon)
- Trapezoids
- Isosc. Trapezoids
- Illogram