

ISU Placement Exam

1. Find the length of the arc cut from a circle of radius 10 cm by the sides of a central angle (vertex at the center of the circle) of 25° .

2. Consider a right triangle with angles A , B and C and opposite sides a , b , c , respectively. If C is 90° , find

i) $\sin A$

ii) $\tan B$

iii) $\csc B$

(express answers in terms of a , b , and c).

If $c = 5$ and $b = 1$, find

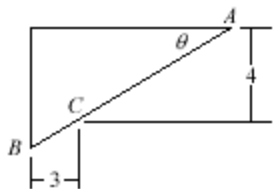
i) $\cos A$

ii) $\cot A$

iii) $\sec B$

(express answers in exact form).

3. Compute the distance AB shown in the right triangle, given that $\theta = 30^\circ$



4. In a standard (x, y) -coordinate system a unit circle is drawn, with center at the origin. An angle θ is sketched, in standard position, and its terminal side meets the circle in the point (p, q) . What are the sine, cosine, and tangent of θ , in terms of p and q ?

5. Determine the exact value of

a. $\sin(300^\circ)$

b. $\sec\left(\frac{13\pi}{6}\right)$

6. In triangle ABC , $A = 65^\circ$, $b = 9$, and $a = 10$. Find B .

7. The diagonals of a parallelogram are 20 cm and 30 cm long and intersect at an angle of 25° . Find the sides of the parallelogram.

8. Complete the following standard identities:

$$\sin(2\theta) =$$

$$\cos(A \pm B) =$$

$$\tan^2 \theta + 1 =$$

9. Find all solutions for θ in the interval $0^\circ \leq \theta \leq 360^\circ$ for $2 \sin \theta \cdot \cos^2 \theta - \sin^3 \theta = 0$

10. Verify that $\cos 3x = 4 \cos^3 x - 3 \cos x$.

11. Find, without a calculator, the real part of $(\cos 30^\circ + i \sin 30^\circ)^{10}$