

Pg. 19: #5.

a) $\tan 40^\circ$
positive
(first quadrant)

b) $\cos 120^\circ$
negative
(2nd quadrant)

c) $\tan 150^\circ$
negative
(2nd quadrant)

d) $\sin 101^\circ$
positive
(2nd quadrant)

e) $\cos 98^\circ$
negative
(2nd quadrant)

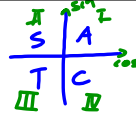

f) $\sin 73^\circ$
positive
(1st quadrant)

6. a) $\cos A = 0.35$
 $\therefore \angle A$ is acute

b) $\tan A = -0.72$
 $\therefore \angle A$ is acute

c) $\sin A = 0.99$
 $\therefore \angle A$ is either acute or obtuse

$0 \leq A \leq 180^\circ$

Feb 14-1:02 PM

Trigonometric Ratios of Obtuse Angles

What are supplementary angles?
- The sum of supplementary angles is 180° .
 $x + y = 180^\circ$

If A is 58° , what is the value of its supplement?
 $58^\circ + \angle S = 180^\circ$
 $\angle S = 180^\circ - 58^\circ$
 $\angle S = 122^\circ$
 \therefore Its supplement is 122° .

Complete the following chart. Round your answers to 4 decimals.

Angle	Sin	Cos	Tan	Supplement	Sin	Cos	Tan
34°	0.5591	0.8290	0.6745	146°	0.5591	-0.8290	-0.6745
125°	0.8192	-0.5736	-1.4281	55°	0.8192	0.5736	1.4281
89°							
72°							
156°							

How are the values in this table related?
The sines of supplementary angles are **equal**.
The cosines of supplementary angles are **opposites**.
The tangents of supplementary angles are **opposites**.

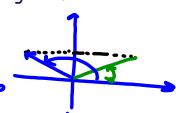
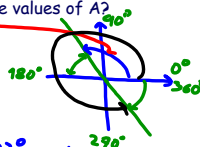
Properties of Supplementary Angles
Given an acute angle, A , and its supplementary obtuse angle ($180^\circ - A$):
 $\sin A = \sin(180^\circ - A)$
 $\cos A = -\cos(180^\circ - A)$
 $\tan A = -\tan(180^\circ - A)$

Sep 9-10:08 PM

Example 1: If $\sin A = 0.6157$, what are the possible angles of A ?
Ans: $\sin A = 0.6157$
 $\angle A = \sin^{-1}(0.6157)$
 $\angle A = 38^\circ$
Its supplement is $180^\circ - 38^\circ = 142^\circ$
 \therefore The possible angles of A are 38° and 142° .

Example 2: If $\tan A = -4.3315$, what are the possible values of A ?
Ans: $\tan A = -4.3315$
 $\angle A = \tan^{-1}(-4.3315)$
 $\angle A = -77^\circ$ (103°)
 $360^\circ - 77^\circ = 283^\circ$
 \therefore The possible values of A are 103° and 283° .

Suppose A is an obtuse angle, determine the measure of A if $\sin A = 0.0054$.
 $\sin A = 0.0054$
 $\angle A = \sin^{-1}(0.0054)$
 $\angle A = 0.3^\circ$
Its supplementary angle is $180^\circ - 0.3^\circ = 179.7^\circ$
 $\therefore \angle A$ is 179.7°

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Example 3: Given the coordinates of P and Q determine the following.

Ans:

$r = \sqrt{x^2 + y^2}$
 $r = \sqrt{(-8)^2 + 14^2}$
 $= \sqrt{64 + 196}$
 $= \sqrt{260}$
 $= \sqrt{4 \times 65}$
 $= 2\sqrt{65}$

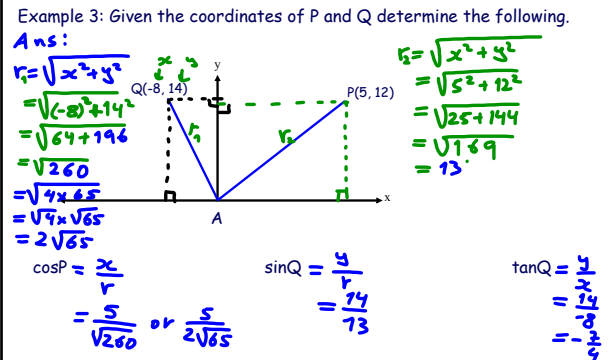
$\cos P = \frac{x}{r} = \frac{-8}{2\sqrt{65}} = \frac{-4}{\sqrt{65}}$

$\sin Q = \frac{y}{r} = \frac{14}{2\sqrt{65}} = \frac{7}{\sqrt{65}}$

$\tan Q = \frac{y}{x} = \frac{14}{-8} = -\frac{7}{4}$

$r = \sqrt{x^2 + y^2} = \sqrt{5^2 + 12^2} = \sqrt{25 + 144} = \sqrt{169} = 13$

Homework: Pg. 23: #2, 3acd, 4 ac, 5 bd, 6 ad, 7-9, 11, 13-15



Feb 9-10:26 AM