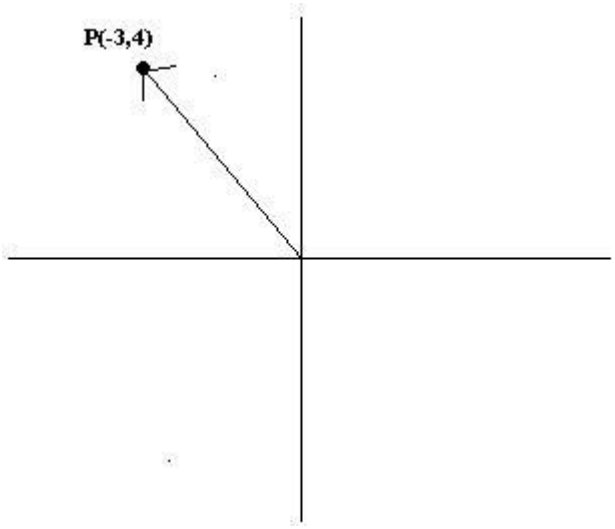
Sketch the graph of the line that goes thru the given terminal point. Give the sine, cosine, and tangent of the angle. Simplify radicals.

(1.) P(-3,4)

(i.) Here is the diagram:



(ii.) $a^2 + b^2 = c^2$ use the pythagorean theorem

$(-3)^2 + (4)^2 = c^2$ make substitutions

$9 + 16 = c^2$ multiply and combine like terms

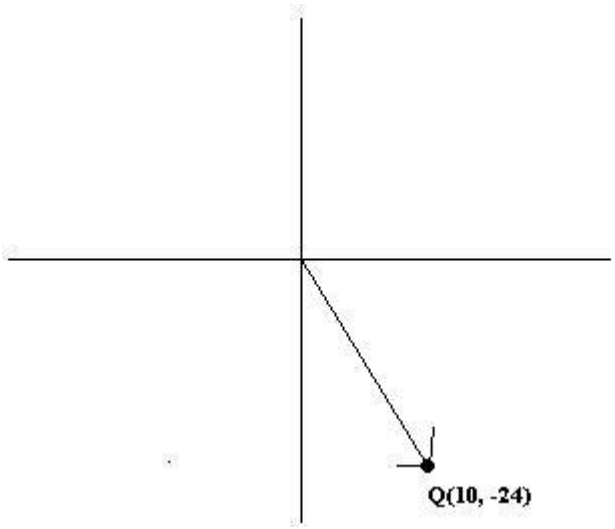
$25 = c^2$ add

$c = 5$ take square roots

results: $\sin P = 4/5$; $\cos P = -3/5$; $\tan P = -4/3$

(2.) Q(10, -24)

(i.) Here is the diagram:



(ii.) $a^2 + b^2 = c^2$ use the pythagorean theorem

$(-24)^2 + (10)^2 = c^2$ make substitutions

$576 + 100 = c^2$ square

$676 = c^2$ combine like terms

$c = 26$ take square roots

results: $\sin Q = -24/26$

$\sin Q = -12/13$ reduce

$\cos Q = 10/26$

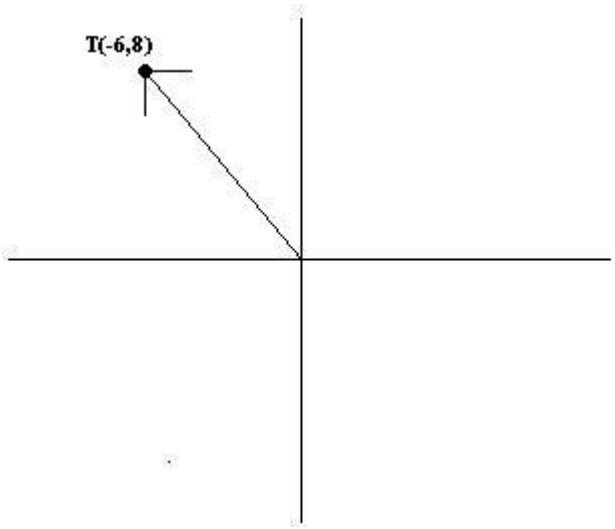
$\cos Q = 5/13$ reduce

$\tan Q = -24/10$

$\tan Q = -12/5$ reduce

(3.) T(-6, 8)

(i.) Here is the diagram:



(ii.) $a^2 + b^2 = c^2$ use the pythagorean theorem

$(-6)^2 + (8)^2 = c^2$ make substitutions

$36 + 64 = c^2$ square

$c^2 = 100$ add

$c = 10$ take square roots

results: $\sin T = 8/10$

$\sin T = 4/5$ reduce

$\cos T = -6/10$

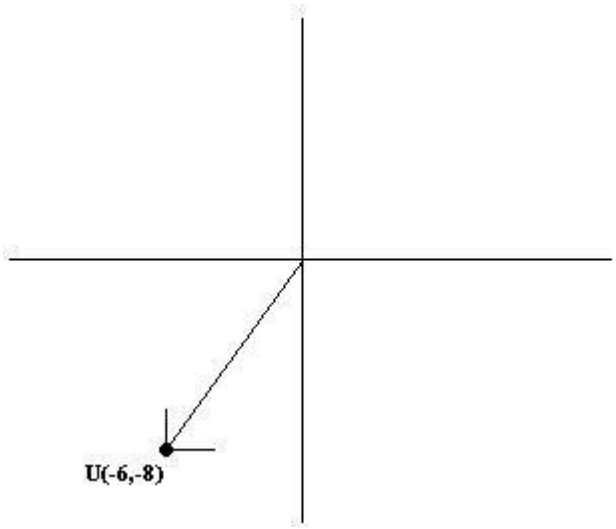
$\cos T = -3/5$ reduce

$\tan T = 8/-6$

$\tan T = -4/3$ reduce

(4.) U(-6, -8)

(i.) Here is the diagram:



(ii.) $a^2 + b^2 = c^2$ use the pythagorean theorem

$(-6)^2 + (-8)^2 = c^2$ make substitutions

$36 + 64 = c^2$ square

$100 = c^2$ combine like terms

$c = 10$ take square roots

results: $\sin U = -8/10$

$\sin U = -4/5$ reduce

$\cos U = -6/10$

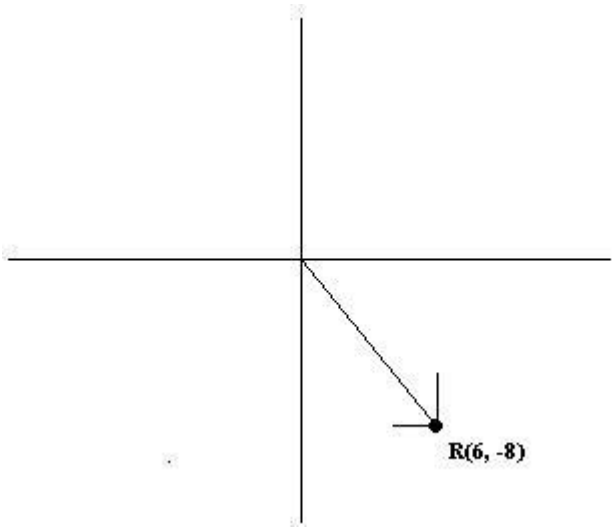
$\cos U = -3/5$

$\tan U = -8/-6$

$\tan U = 4/3$

(5.) R(6, -8)

(i.) Here is the diagram:



(ii.) $a^2 + b^2 = c^2$ use the pythagoean theorem

$(6)^2 + (-8)^2 = c^2$ make substitutions

$36 + 64 = c^2$ multiply

$100 = c^2$ combine like terms

$c = 10$ take square roots

results: $\sin R = -8/10$

$\sin R = -4/5$ reduce

$\cos R = 6/10$

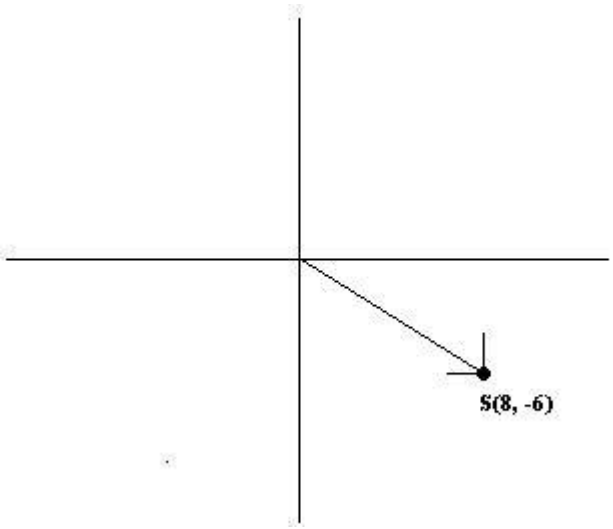
$\cos R = 3/5$ reduce

$\tan R = -8/6$

$\tan R = -4/3$ reduce

(6.) S(8, -6)

(i.) Here is the diagram:



(ii.) $a^2 + b^2 = c^2$ use the pythagorean theorem

$(8)^2 + (-6)^2 = c^2$ make substitutions

$64 + 36 = c^2$ multiply

$c^2 = 100$ add

$c = 10$ take square roots

results: $\sin S = -6/10$

$\sin S = -3/5$ reduce

$\cos S = 8/10$

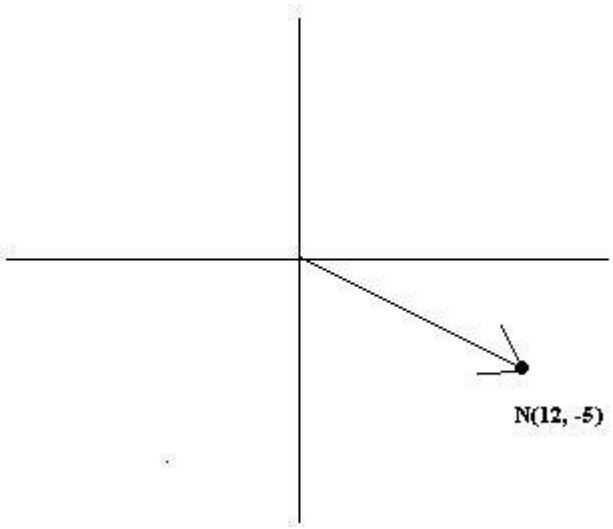
$\cos S = 4/5$ reduce

$\tan S = -6/8$

$\tan S = -3/4$

(7.) N(12, -5)

(i.) Here is the diagram:



(ii.) $a^2 + b^2 = c^2$ use the pythagorean theorem

$(12)^2 + (-5)^2 = c^2$ make substitutions

$144 + 25 = c^2$ multiply

$c^2 = 169$ add

$c = 13$ take sq root

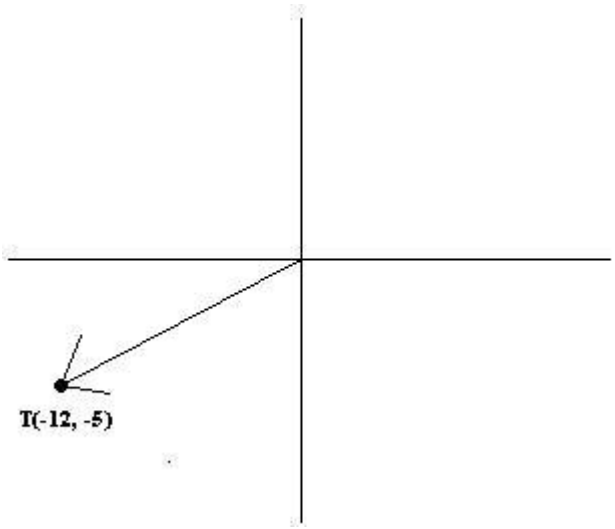
results: sin N = -5/13

cos N = 12/13

tan N = -5/12

(8.) T(-12, -5)

(i.) Here is the diagram:



(ii.) $a^2 + b^2 = c^2$ use the pythagorean thoerem

$(-12)^2 + (5)^2 = c^2$ make substitutions

$144 + 25 = c^2$ multiply

$c^2 = 169$ add

$c = 13$ take square roots

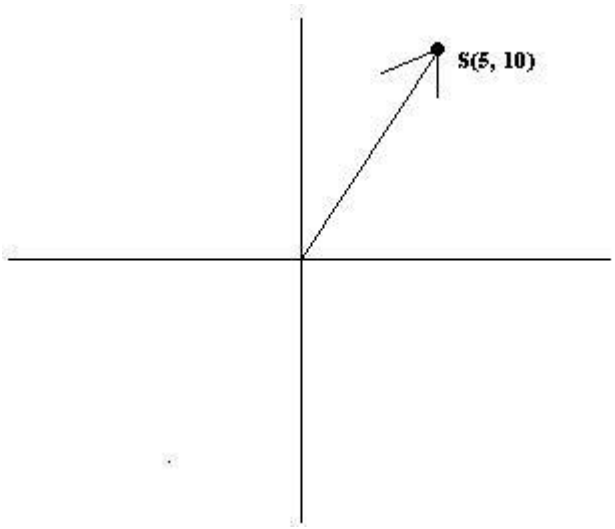
results: sin T = -5/13

cos T = -12/13

tan T = 5/12

(9.) S(5, 10)

(i.) Here is the diagram:



(ii.) $a^2 + b^2 = c^2$ use the pythagorean theorem

$(5)^2 + (10)^2 = c^2$ make substitutions

$25 + 100 = c^2$ multiply

$c^2 = 125$ add

$c^2 = 25*5$ factor like this

$c = 5\sqrt{5}$ take square roots

results: $\sin S = 10/5\sqrt{5}$

$\sin A = 5/\sqrt{5}$ reduce

$\sin A = 5\sqrt{5}/5$ multiply top and bottom by $\sqrt{5}$

$\sin A = \sqrt{5}$ cancel

$\cos A = 5/5\sqrt{5}$

$\cos A = 1/\sqrt{5}$ reduce

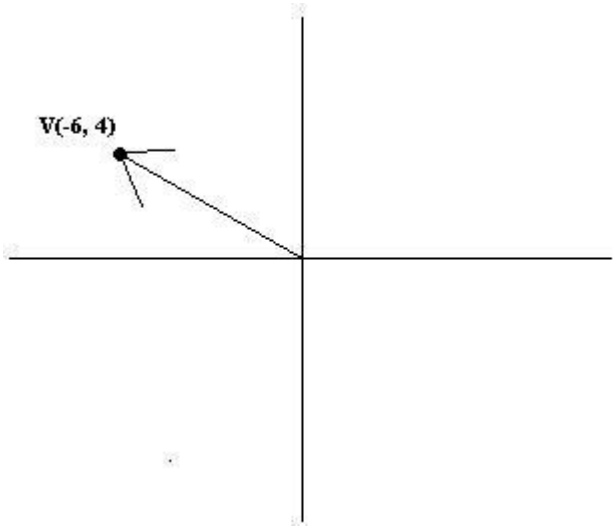
$\cos A = \sqrt{5}/5$ multiply top and bottom by $\sqrt{5}$

$\tan A = 10/5$

$\tan A = 2$ divide

(10.) V(-6, 4)

(i.) Here is the diagram:



(ii.) $a^2 + b^2 = c^2$ use the pythagorean theorem

$(-6)^2 + (4)^2 = c^2$ make substitutions

$36 + 16 = c^2$ multiply

$c^2 = 52$ add

$c^2 = 4*13$ factor like this

$c = 2\sqrt{13}$ take square roots

results: $\sin V = 4/2\sqrt{13}$

$\sin V = 2/\sqrt{13}$ reduce

$\sin V = 2\sqrt{13}/13$ multiply top and bottom by $\sqrt{13}$

$\cos V = -6/2\sqrt{13}$

$\cos V = -3/\sqrt{13}$ reduce

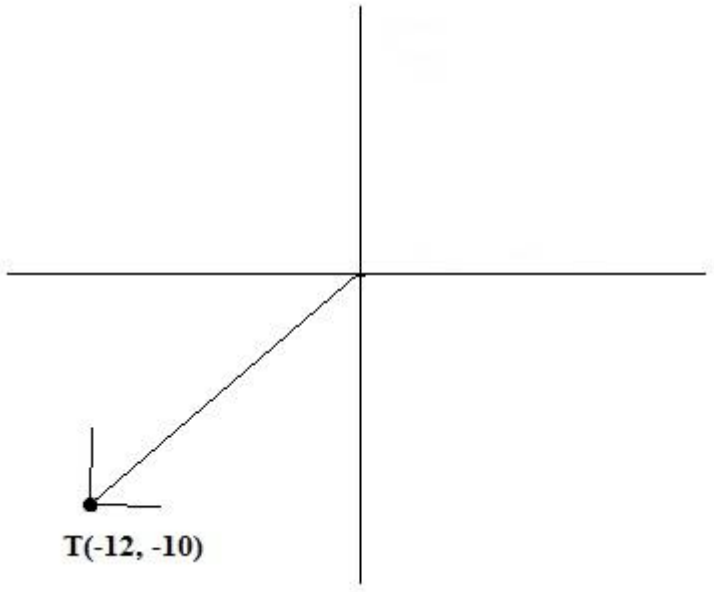
$\cos V = -3\sqrt{13}/13$ multiply top and bottom by $\sqrt{13}$

tan V = 4/-6

tan V = -2/3 reduce

(11.) T(-12, -10)

(i.) Here is the diagram:



(ii.) $a^2 + b^2 = c^2$ use the pythagorean theorem

$(-12)^2 + (-10)^2 = c^2$ make substitutions

$144 + 100 = c^2$ multiply

$c^2 = 244$ add

$c^2 = 4*61$ factor like this

$c = 2\sqrt{61}$ take sq roots

results: $\sin T = -10/2\sqrt{61}$

$\sin T = -5/\sqrt{61}$ reduce

$\sin T = -5\sqrt{61}/61$ multiply top and bottom

by $\sqrt{61}$

$\cos T = -12/2\sqrt{61}$

$\cos T = -6/\sqrt{61}$ reduce

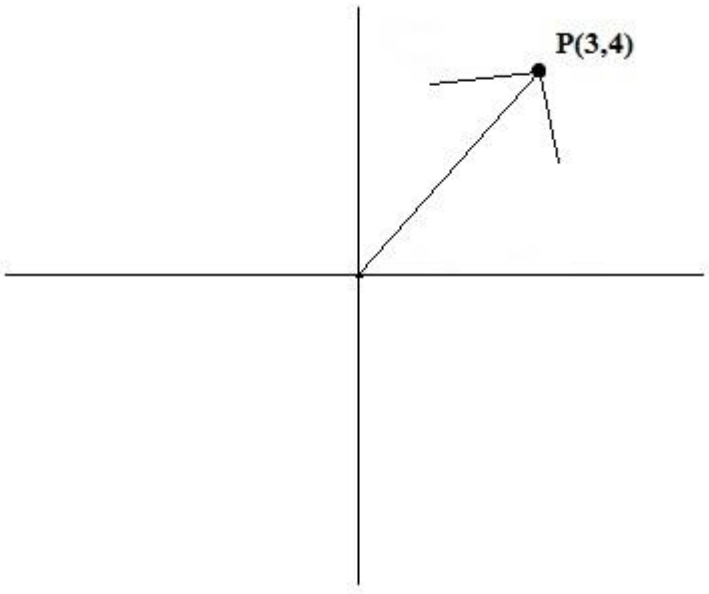
$\cos T = -6\sqrt{61}/61$ multiply top and bottom by $\sqrt{61}$

$\tan T = -10/-12$

$\tan T = 5/6$ reduce

(12.) P(3,4)

(i.) Here is the diagram:



(ii.) $a^2 + b^2 = c^2$ use the pythagorean theorem

$(3)^2 + (4)^2 = c^2$ make substitutions

$c^2 = 9 + 16$ multiply

$c^2 = 25$ add

$c = 5$ take sq roots

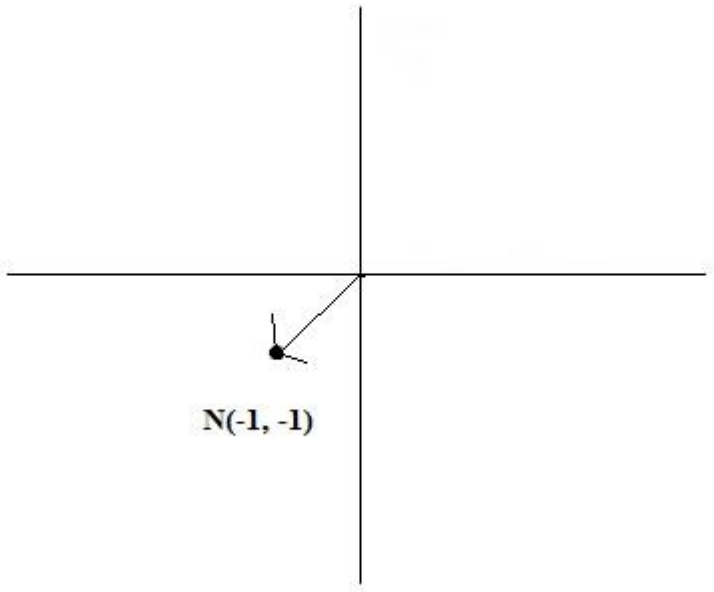
results: $\sin P = 4/5$

$\cos P = 3/5$

$\tan P = 4/3$

(13.) N(-1,-1)

(i.) Here is the diagram:



(ii.) $a^2 + b^2 = c^2$ use the pythagorean theorem

$(-1)^2 + (-1)^2 = c^2$ make substitutions

$1 + 1 = c^2$ multiply

$c^2 = 2$ add

$c = \sqrt{2}$ take square roots

results: $\sin N = -1/\sqrt{2}$

$\sin N = -\sqrt{2}/2$ multiply top and bottom by $\sqrt{2}$

$\cos N = -1/\sqrt{2}$

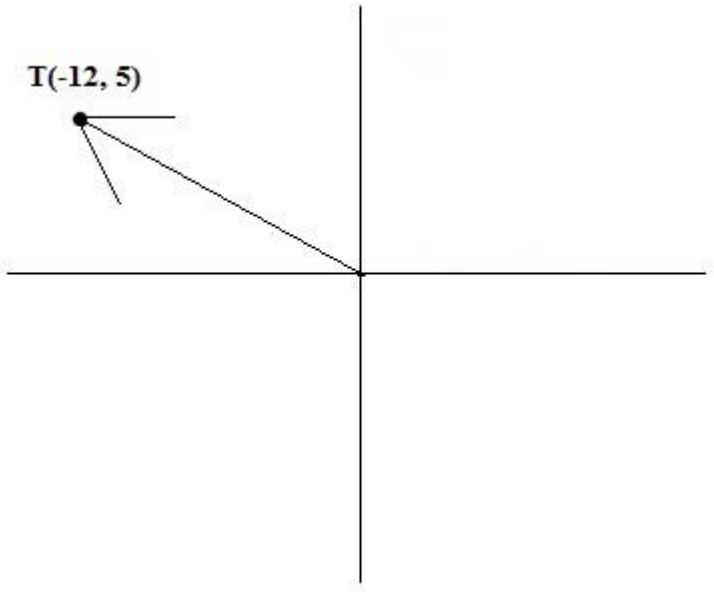
$\cos N = -\sqrt{2}/2$ multiply top and bottom by $\sqrt{2}$

$\tan N = -1/-1$

$\tan N = 1$ divide

(14.) T(-12, 5)

(i.) Here is the diagram:



(ii.) $a^2 + b^2 = c^2$ use the pythagorean theorem

$(-12)^2 + (5)^2 = c^2$ make substitutions

$144 + 25 = c^2$ multiply

$c^2 = 169$ add

$c = 13$ take square roots

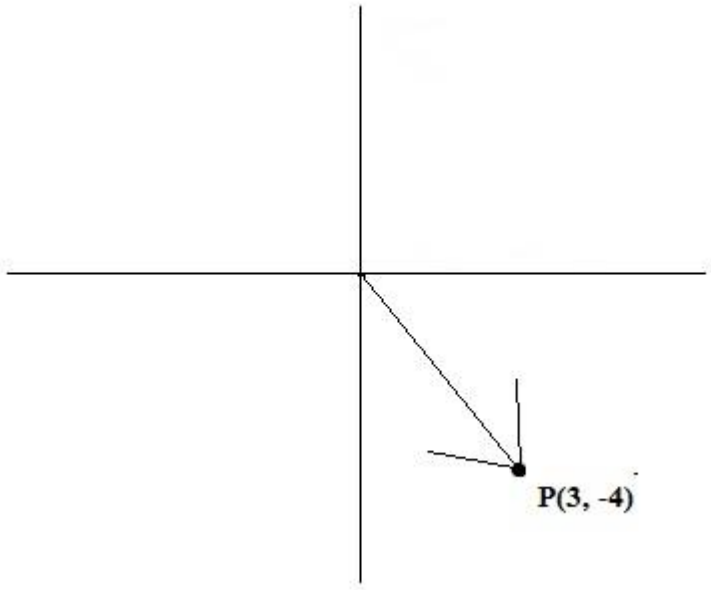
results: $\sin T = 5/13$

$\cos T = -12/13$

$\tan T = -5/12$

(15.) P(3,-4)

(i.) Here is the diagram:



(ii.) $a^2 + b^2 = c^2$ use the pythagorean theorem

$(3)^2 + (-4)^2 = c^2$ make substitutions

$9 + 16 = c^2$ multiply

$c^2 = 25$ add

$c = 5$ take square roots

results: $\sin P = -4/5$

$\cos P = 3/5$

$\tan P = -4/3$

Find the sin and the cosine from the given information.

Angle A is in Quadrant I.

(16.) $\tan A = 2/3$

sin A = 2/√13

cos A = 3/√13

(17.) tan A = 5/12

sin A = 5/13

cos A = 12/13

(18.) tan A = 3/4

sin A = 3/5

cos A = 4/5

(19.) tan A = 15/8

sin A = 15/17

cos A = 8/17