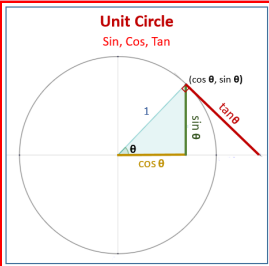
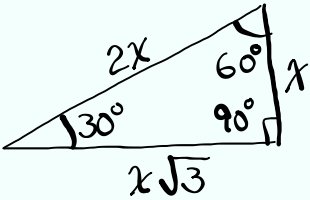


Trigonometry Lecture 6

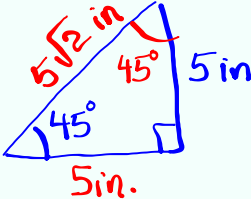
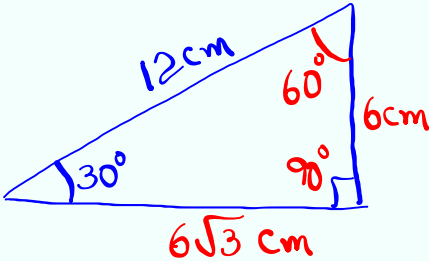
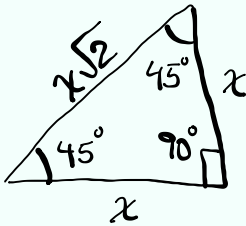


Feb 19-8:47 AM

$30^\circ - 60^\circ - 90^\circ$



$45^\circ - 45^\circ - 90^\circ$



Sep 4-10:29 AM

Rationalize the denominator

$$\frac{5}{\sqrt{10}} = \frac{5 \cdot \sqrt{10}}{\sqrt{10} \cdot \sqrt{10}} = \frac{5\sqrt{10}}{\sqrt{100}} = \frac{\cancel{5}\sqrt{10}}{\cancel{10}_2} = \boxed{\frac{\sqrt{10}}{2}}$$

$$\begin{aligned} \frac{2}{\sqrt{5} - \sqrt{3}} &= \frac{2 \cdot (\sqrt{5} + \sqrt{3})}{(\sqrt{5} - \sqrt{3})(\sqrt{5} + \sqrt{3})} \\ &= \frac{2(\sqrt{5} + \sqrt{3})}{\sqrt{25} + \sqrt{15} - \sqrt{15} - \sqrt{9}} \\ &= \frac{2(\sqrt{5} + \sqrt{3})}{\underbrace{5 - 3}_2} \\ &= \boxed{\sqrt{5} + \sqrt{3}} \end{aligned}$$

Sep 4-10:33 AM

1) Rationalize the numerator $\frac{\sqrt{2}}{8} = \frac{\sqrt{2} \cdot \sqrt{2}}{8 \cdot \sqrt{2}} = \frac{\sqrt{4}}{8\sqrt{2}} = \frac{\cancel{2}}{\cancel{8}_4\sqrt{2}} = \frac{1}{4\sqrt{2}}$

2) Rationalize the denominator $\frac{2}{\sqrt{3} + 1}$

$$\begin{aligned} \frac{2}{\sqrt{3} + 1} &= \frac{2(\sqrt{3} - 1)}{(\sqrt{3} + 1)(\sqrt{3} - 1)} = \frac{2(\sqrt{3} - 1)}{\sqrt{9} - \sqrt{3} + \sqrt{3} - 1} \\ &= \frac{2(\sqrt{3} - 1)}{\underbrace{3 - 1}_2} \\ &= \boxed{\sqrt{3} - 1} \end{aligned}$$

Sep 4-10:38 AM

If $u^2 = k$ and $k \geq 0$, then $u = \pm\sqrt{k}$

Square-Root Method

Solve $x^2 - 12 = 4$.

$$x^2 = 16$$

use S.R.M.

$$x = \pm\sqrt{16}$$

$$x = \pm 4$$

Soln. Set $\{\pm 4\}$

Sep 4-10:45 AM

Solve $(x-1)^2 = 20$

use S.R.M.

$$x - 1 = \pm\sqrt{20}$$

$$x = 1 \pm\sqrt{20}$$

$$x = 1 \pm\sqrt{4\sqrt{5}}$$

$$x = 1 \pm 2\sqrt{5}$$

$\{1 \pm 2\sqrt{5}\}$

Sep 4-10:48 AM

Solve $(2x + 3)^2 = 25$

use S.R.M.

$$2x + 3 = \pm \sqrt{25}$$

$$2x + 3 = \pm 5$$

$$2x + 3 = 5$$

OR

$$2x + 3 = -5$$

$$2x = 5 - 3$$

$$2x = -5 - 3$$

$$2x = 2$$

$$2x = -8$$

$$\boxed{x = 1}$$

$$\boxed{x = -4}$$

$\{-4, 1\}$

Sep 4-10:50 AM

Solve $x^2 - 8x - 9 = 0$

a) by factoring $(x + 1)(x - 9) = 0$

by Zero-Product Rule

$$x + 1 = 0 \quad \text{OR} \quad x - 9 = 0$$

$$x = -1 \quad \quad \quad x = 9$$

$\{-1, 9\}$

b) by quadratic formula.

$$ax^2 + bx + c = 0 \quad \rightarrow \quad x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x^2 - 8x - 9 = 0$$

$$b^2 - 4ac = (-8)^2 - 4(1)(-9)$$

$$a = 1, b = -8, c = -9$$

$$= 64 + 36 = 100$$

$$x = \frac{8 \pm 10}{2} = \frac{18}{2} = 9$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{8 - 10}{2} = \frac{-2}{2} = -1$$

$$= \frac{-(-8) \pm \sqrt{100}}{2(1)} = \frac{8 \pm 10}{2}$$

$\{-1, 9\}$

Sep 4-10:54 AM

c) by Completing the Square

$$x^2 - 8x - 9 = 0$$

$$x^2 - 8x + 16 = 9 + 16$$

Leading Coef. = 1 take half Square it Add to both Sides

$$(x - 4)^2 = 25$$

Use S.R.M.

$$\{-1, 9\}$$

$$x - 4 = \pm\sqrt{25}$$

$$x - 4 = \pm 5$$

$$x = 4 \pm 5$$

$\rightarrow x = 4 + 5 = 9$
 $\rightarrow x = 4 - 5 = -1$

Sep 4-11:01 AM

Solve $x^2 + 6x + 8 = 0$

1) by factoring $(x+4)(x+2) = 0$ $\{-4, -2\}$

$$x+4=0 \quad x+2=0$$

$$x=-4 \quad x=-2$$

2) by quadratic formula $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$a=1, b=6, c=8$

$$b^2 - 4ac = 6^2 - 4(1)(8) = 36 - 32 = 4$$

$$x = \frac{-6 \pm \sqrt{4}}{2} = \frac{-6 \pm 2}{2}$$

$$x = \frac{-6+2}{2} = -2 \quad x = \frac{-6-2}{2} = -4$$

3) by Completing the Square. $x = \frac{-6 \pm 2}{2} = -4$

$$x^2 + 6x + 8 = 0$$

$$x^2 + 6x + 9 = -8 + 9$$

Lead. Coef. = 1 take half Square Add to both Sides $(x+3)^2 = 1$ by S.R.M.

$$x+3 = \pm\sqrt{1}$$

$$x = -3 \pm 1$$

$$x = -3 + 1 = -2$$

$$x = -3 - 1 = -4$$

$\{-4, -2\}$

Sep 4-11:06 AM