Trig   7.5

Solve trig equations
Solve trig inequalities

identity

equation

domain

      principal values (depends on which function is used...)

      all real values (look in all quadrants, 2πn etc.)

      default: radians

      degrees only if specified in problem

All the properties of equation solving (algebra):
      factoring
      zero product property
      etc.

whiteboards

$$\cos 2x + 3\cos x - 1 = 0$$

$$\underline{2\cos^2 x - 1} + 3\cos x - 1 = 0 \qquad \cos 2x = 2\cos^2 x - 1$$

$$2\cos^2 x + 3\cos x - 2 = 0$$

$\dfrac{-4}{14}$

$$2a^2 + 3a - 2 = 0 \qquad\qquad \cos x = \tfrac{1}{2}$$

$x = \tfrac{1}{2} \qquad x = \dfrac{-3 \pm \sqrt{9 - 4 \cdot 2 \cdot -2}}{4} \qquad \cancel{\cos x = -2}$

$x = -2 \qquad\qquad = \dfrac{-3 \pm \sqrt{9 + 16}}{4}$

$$x = \dfrac{-3 \pm 5}{4}$$

60, 60
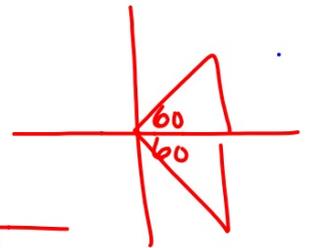
60, 30₀

Solve $x^2 + 6x = 0$

ep P. A -39,
7.5 + 4 probs (not easy ones)

Principal values
(Which quadrants should I look in?)
Depends on which function it is.

Solve each equation for principal values of x. Express solutions in degrees.

x=

5. $2 \sin x + 1 = 0$

6. $2 \cos x - \sqrt{3} = 0$

Solve each equation for $0° \leq x < 360°$.

1. express using only one trig function (parking lot)
2. factor, maybe QF to solve

7. $\sin x \cot x = \dfrac{\sqrt{3}}{2}$

8. $\cos 2x = \sin^2 x - 2$

Tan & cot are sometimes undefined...
(divide by 0: unjt circle...graphs...)

1 Solve $\sin x \cos x - \frac{1}{2} \cos x = 0$ for principal values of x. Express solutions in degrees.

x=

Express using the same trig function for all...   factor/solve for x=

2 Solve $\cos^2 x - \cos x + 1 = \sin^2 x$ for $0 \le x < 2\pi$.

Same trig function

Solve each equation for all real values of x.

12. $\tan^2 x + 2 \tan x + 1 = 0$

Are there ever any values where tan is undefined? (might need to DQ an answer)

Maybe x-factor...factor by grouping, QF etc.

Solve each equation for $0 \leq x < 2\pi$.

9. $3 \tan^2 x - 1 = 0$
10. $2 \sin^2 x = 5 \sin x + 3$

Are there ever any values where tan is undefined?