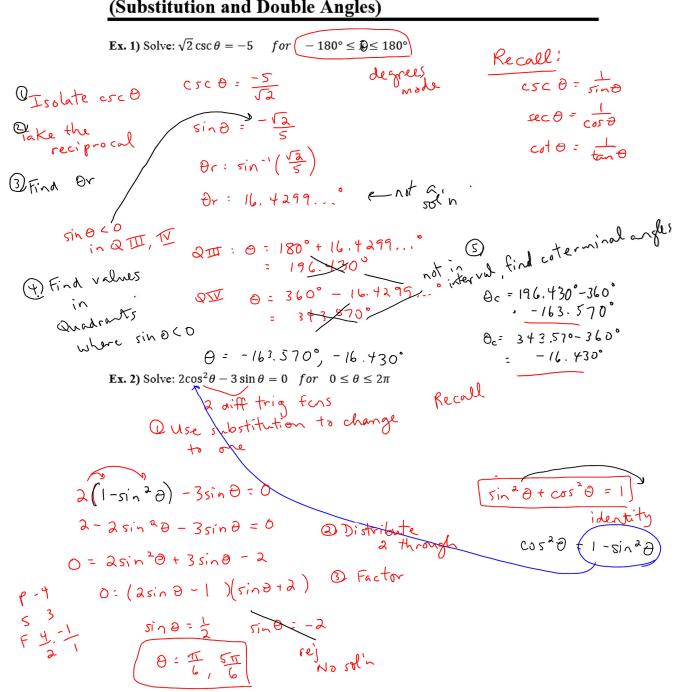
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Pre-Calculus 12 Solving Trig Equations Algebraically (Substitution and Double Angles)



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Ex. 3) Solve for
$$\theta$$
: $4\sin^2\theta - 7\cos\theta - 2 = 0$ for $0 \le \theta \le 2\pi$

$$\frac{1}{1 - \cos^2\theta} - 7\cos\theta - 2 = 0$$

$$\frac{1}{1 - \cos^2\theta} - 7\cos\theta - 2 = 0$$

$$\frac{1}{1 - \cos^2\theta} - 7\cos\theta - 2 = 0$$

$$0 = 4\cos^2\theta + 7\cos\theta - 2$$

$$0 = (4\cos\theta - 1)(\cos\theta + 2)$$

$$\cos\theta = \frac{1}{4} \cos^2\theta - \cos\theta + 2$$

$$\cos\theta = \frac{1}{4} \cos\theta - \cos\theta - 2$$

$$\cos\theta = \frac{1}{4} \cos\theta - 2$$

$$\cos\theta = \frac{1$$

$$\sin^2\theta + \cos^2\theta = 1$$

$$\sin^2\theta = 1 - \cos^2\theta$$

Also on formula shet $|+\cos t^2\theta = \csc^2\theta$ $|+\cos^2\theta + |= \sec^2\theta$

Double Angles

Ex. 4) Solve
$$cos(2\theta) = 1$$
 for $0 \le \theta \le 2\pi$

Replace cos 20 with a double angle identity

$$\frac{1-2\sin^2\theta}{0=3\sin^2\theta}$$

$$0=\sin^2\theta$$

$$0=\sin\theta$$

$$\theta=0, \pi, 2\pi$$

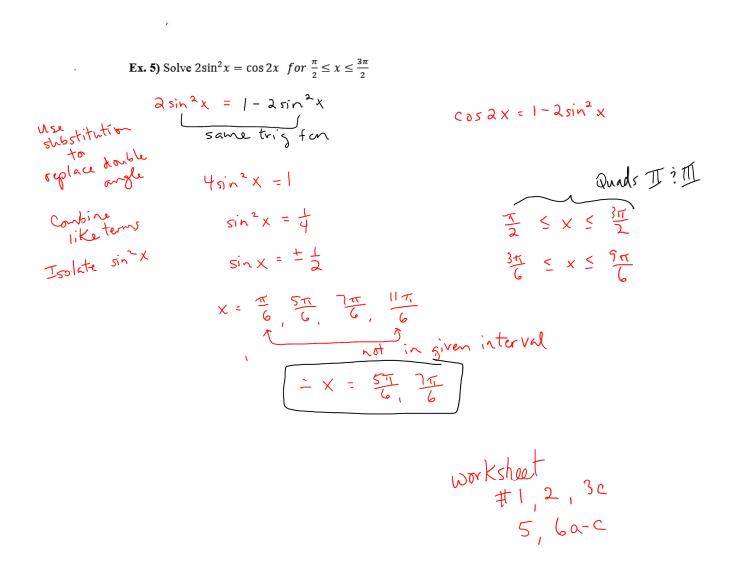
$$cos 2\theta = cos^2\theta - sin^2\theta$$

$$cos 2\theta = |-2sin^2\theta$$

$$cos 2\theta = 2cos^2\theta - 1$$

Recall:
If
$$\sin^2\theta = 1$$
,
then $\sin\theta = \pm 1$

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Assignment: Handout "Trig Equations Worksheet" #1a, 2c, 3b,c, 4a, 5a,c,e, 6b