a).

$\cos(3x+2) = \frac{\sqrt{2}}{2}$ → Cosine three x plus two is equal to square root of two over two.

$3x + 2 = t$ → Three x plus two is equal to t, because I substitute t for argument of the cosine,

$\cos t = \frac{\sqrt{2}}{2}$ → so cosine of t is square root of two over two.

$t_0 = \frac{\pi}{4}$ → My to is Pi over four, so now I have two possibilities;

$t = t_0 + 2k\pi$ v $t = (\pi - t_0) + 2k\pi$

t is equal to to plus two kPi or

t is equal to Pi minus to plus two kPi

$t = \frac{\pi}{4} + 2k\pi$ v $t = \frac{3\pi}{4} + 2k\pi$

t is equal to Pi over four plus two kPi or

t is equal to three Pi over four plus two kPi

I go back to the reiable t:

III $3x+2 = \frac{\pi}{4} + 2\pi k$ v $3x+2 = \frac{3\pi}{4} + 2\pi k$

three x plus two is equal to Pi over four plus Eno kPi or

three x plus two is equal to Three Pi over four plus two kPi

IV $3x = \frac{\pi}{4} + 2\pi k - 2$ v $3x = \frac{3\pi}{4} + 2\pi k - 2$

Two comes to the right side with opposite sign.

I divide all equations by three and obtain x:

$$x = \frac{\frac{\pi}{4} - 2 + 2k\pi}{3} \quad v \quad x = \frac{\frac{3\pi}{4} - 2 + 2k\pi}{3}$$

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b).

$\sin\left(2x - \frac{\pi}{4}\right) = \frac{1}{2}$ → Sine of two x minus Pi over four is equal to one half.

$2x - \frac{\pi}{4} = t$

$\sin t = \frac{1}{2}$ → I substitute t for the argument of the sine, so sine of t is one half.

$t_0 = \frac{\pi}{6}$ → My t zero is Pi over six, so now I have two possibilities;

$t = t_0 + 2k\pi \quad \vee \quad t = (\pi - t) + 2k\pi$

(1.) t is equal to t zero plus two k Pi or
t is equal to Pi minus t zero plus two k Pi.

$t = \frac{\pi}{6} + 2k\pi \quad \vee \quad t = \frac{5\pi}{6} + 2k\pi$

(2.) t is equal to Pi over six plus two k Pi or
t is equal to five Pi over six plus two k Pi.

$2x - \frac{\pi}{4} = \frac{\pi}{6} + 2k\pi \quad \vee \quad 2x - \frac{\pi}{4} = \frac{5\pi}{6} + 2k\pi$

And finally I obtain X: ?

$x = \frac{\frac{\pi}{6} - \frac{\pi}{4} + 2k\pi}{2} \quad \vee \quad x = \frac{\frac{5\pi}{6} - \frac{\pi}{4} + 2k\pi}{2}$

... And after some simplifications I get two answers, x is equal to -Pi over twenty four plus k Pi or to seven over twenty four plus k Pi: ?

$x = -\frac{\pi}{24} + k\pi \quad \vee \quad x = \frac{7}{24} + k\pi$

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