

F = First O = Outer I = Inner L = Last

Factor #1-8 using the FOIL method or GCF (Greatest Common Factor.)

Solve #9-14 by factoring, then apply zero product property.

1. $\sin^2 x + 8\sin x - 48 = (\sin x + 12)(\sin x - 4)$

add

F O I L

$12\sin x - 4\sin x = 8\sin x$

2. $3x^2 + 7x + 2 = (3x + 1)(x + 2)$

F O I L

add

$1x + 6x = 7x$

3. $8x^2y + 20xy$

4. $\sin^2 x - 15\sin x + 50$

5. $7\sin^2 x - 9\sin x + 2$

6. $9x^2 - 9xy + 2y^2$

13. $3x^2 + 14x + 5 = 10$

14. $2\sin^2 \theta - \sin \theta = 0$

→hint: factor GCF as in problem #8, set equal to 0,
then find 4 solutions for $0 \leq \theta < 2\pi$

$\sin \theta (2\sin \theta - 1) = 0$

$\sin \theta = 0$ $2\sin \theta - 1 = 0$ so... $\sin \theta = \frac{1}{2}$

15. $2\cos^2 \theta + 5\cos \theta - 3 = 0$

→hint: factor using FOIL, set equal to 0,
then find 2 solutions for $0 \leq \theta < 2\pi$

16. $\sqrt{3} \tan \theta + \tan^2 \theta = 0$ →hint: similar to #14

Use unit circle to find 2 solutions

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CHECK ANSWERS:

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|---------------|--------------|----------------|----------------|----------------|---------------|---------------|---------------|---------------|---------------|---|---------------|-----------------|------------------|------------------|------------------|-----------------|------------------|-------|-------|
| $\sin x - 10$ | $\sin x - 5$ | $\sin x - 4$ | $\sin x - 1$ | $\sin x$ | $\sin x + 12$ | $2\sin x - 1$ | $7\sin x - 2$ | | | | | | | | | | | | |
| $x - 7y$ | $3x - y$ | $3x - 2y$ | $x + 2$ | $2x + 5$ | $3x + 1$ | $3x + y$ | $4xy$ | | | | | | | | | | | | |
| -5 | -1 | $-\frac{1}{2}$ | $-\frac{1}{2}$ | $-\frac{1}{3}$ | 0 | 0 | 0 | $\frac{1}{3}$ | $\frac{1}{3}$ | 1 | $\frac{7}{4}$ | $\frac{\pi}{3}$ | $\frac{2\pi}{3}$ | $\frac{5\pi}{3}$ | $\frac{5\pi}{3}$ | $\frac{\pi}{6}$ | $\frac{5\pi}{6}$ | π | π |

$$7. 3x^2 - 20xy - 7y^2$$

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

$$9. 6x^2 + 3x = 0$$

$$10. 4x^2 - 11x + 7 = 0$$

$$11. 6x^2 + 5x = -1$$

$$12. 3x^2 + 2x + 4 = 5$$
