

$$1. 10x^2 - 5x = 0$$

$$5x(2x - 1) = 0$$

$$\cancel{5}x = 0$$

$$\cancel{5} \quad 5$$

$$x = 0$$

$$2x - 1 = 0$$

$$+1 \quad +1$$

$$\cancel{2}x = 1$$

$$\cancel{2} \quad 2$$

$$x = 1/2$$

can only solve by factoring

$$2. 81x^2 - 16 = 0$$

factoring

square root

$$81x^2 - 16 = 0$$

$$(9x - 4)(9x + 4) = 0$$

$$9x - 4 = 0$$

$$+4 \quad +4$$

$$\cancel{9}x = 4$$

$$\cancel{9} \quad 9$$

$$x = 4/9$$

$$9x + 4 = 0$$

$$-4 \quad -4$$

$$\cancel{9}x = -4$$

$$\cancel{9} \quad 9$$

$$x = -4/9$$

$$81x^2 - 16 = 0$$

$$+16 \quad +16$$

$$\cancel{81}x^2 = 16$$

$$\cancel{81} \quad 81$$

$$\sqrt{x^2} = \sqrt{\frac{16}{81}}$$

$$x = \pm \sqrt{\frac{16}{81}} = \pm \frac{4}{9}$$

$$3. 3(x+1)^2 - 9 = 0$$

$$+9 \quad +9$$

$$\cancel{3}(x+1)^2 = 9$$

$$\cancel{3} \quad 3$$

$$\sqrt{(x+1)^2} = \sqrt{3}$$

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

$$\cancel{+1} \quad -1$$

$$x = \sqrt{3} - 1$$

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

$$\cancel{+1} \quad -1$$

$$x = -\sqrt{3} - 1$$

$$4. 6x^2 = 23x - 7$$

$$+7 \quad +7$$

$$6x^2 + 7 = 23x$$

$$-23x \quad -23x$$

$$6x^2 - 23x + 7 = 0$$

$$(2x - 7)(3x - 1) = 0$$

$$2x - 7 = 0$$

$$\cancel{+7} \quad +7$$

$$\cancel{2}x = 7$$

$$\cancel{2} \quad 2$$

$$3x - 1 = 0$$

$$x = 1/3$$

*can only solve by factoring

$$5. 2(x-3)^2 - 40 = 0$$

$$+40 \quad +40$$

$$\cancel{2}(x-3)^2 = 40$$

$$\cancel{2} \quad 2$$

$$\sqrt{(x-3)^2} = \sqrt{20}$$

$$x-3 = \sqrt{20}$$

$$\cancel{+3} \quad +3$$

$$x = \sqrt{20} + 3$$

$$x = 2\sqrt{5} + 3$$

$$x-3 = -\sqrt{20}$$

$$\cancel{+3} \quad +3$$

$$x = -\sqrt{20} + 3$$

$$x = -2\sqrt{5} + 3$$

$$6. 9x(x-7) - 4(x-7) = 0$$

$$(9x - 4)(x - 7) = 0$$

$$9x - 4 = 0$$

$$+4 \quad +4$$

$$\cancel{9}x = 4$$

$$\cancel{9} \quad 9$$

$$x = 4/9$$

$$x - 7 = 0$$

$$\cancel{+7} \quad +7$$

$$x = 7$$

*factor by grouping

$$7. \cancel{f(x)} = \frac{5}{2}x^2 - 10$$

+10 +10

$$\frac{2}{5} \cdot 10 = \frac{2}{5} \cdot \frac{5}{2} x^2$$

$$\sqrt{4} = \sqrt{x^2}$$

$$x = \sqrt{4}$$

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

$$x = 2$$

$$x = -2$$

$$8. \cancel{f(x)} = 21x - 3x^2$$

$$0 = 21x - 3x^2$$

$$0 = 3x(7-x)$$

$$\frac{3}{3}x = 0$$

$$x = 0$$

$$7-x = 0$$

+x +x

$$7 = x$$

$$x = 7$$

*factor GLF

$$9. \cancel{f(x)} = 6x^2 + 15x - 36$$

$$0 = 6x^2 + 15x - 36$$

$$0 = 3(2x^2 + 5x - 12)$$

$$0 = 3(2x-3)(x+4)$$

$$2x-3 = 0$$

+3 +3

$$x = \frac{3}{2}$$

$$x+4 = 0$$

-4 -4

$$x = -4$$

$$10. \cancel{f(x)} = 8(x - \frac{1}{2})^2 - 2$$

+2 +2

$$\frac{2}{8} = \frac{8(x - \frac{1}{2})^2}{8}$$

$$\sqrt{\frac{1}{4}} = \sqrt{(x - \frac{1}{2})^2}$$

$$\sqrt{\frac{1}{4}} = x - \frac{1}{2}$$

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

+1/2 +1/2

$$x = 1$$

$$-\sqrt{\frac{1}{4}} = x - \frac{1}{2}$$

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

+1/2 +1/2

$$x = 0$$

$$11. \cancel{f(x)} = 16x^2 - 5$$

+5 +5

$$\frac{5}{16} = \frac{16x^2}{16}$$

$$\sqrt{\frac{5}{16}} = \sqrt{x^2}$$

$$x = \sqrt{5/16}$$

$$x = \frac{\sqrt{5}}{4}$$

$$x = -\sqrt{5/16}$$

$$x = -\frac{\sqrt{5}}{4}$$

$$12. \cancel{f(x)} = 2x^3 - x^2 - 10x + 5$$

$$0 = x^2(2x-1) - 5(2x-1)$$

$$0 = (x^2 - 5)(2x-1)$$

$$x^2 - 5 = 0$$

+5 +5

$$\sqrt{x^2} = \sqrt{5}$$

$$x = \sqrt{5}$$

$$x = -\sqrt{5}$$

$$2x-1 = 0$$

+1 +1

$$2x = 1$$

2

$$x = 1/2$$