Solving by Factoring Practice

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Solving by Factoring…

ICM Name_____

Solving by Factoring Practice

Date_____ Period____

Factor each and find all roots.

1) $x^3 + 3x^2 - 4x = 0$

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

$x(x+4)(x-1)=0$

$x=0 \quad x+4=0 \quad x-1=0$

$x=0 \quad x=-4 \quad x=1$

2) $x^3 + x^2 - 3x - 3 = 0$

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

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

$x^2-3=0 \quad x+1=0$

$x^2=3 \quad x=-1$

$x=\pm\sqrt{3}$

3) $x^4 - 3x^2 - 18 = 0$

m	a
-18	-3
3, -6	

$(x^2+3)(x^2-6)=0$

$x^2+3=0 \quad x^2-6=0$

$x^2=-3 \quad x^2=6$

$x=\pm i\sqrt{3} \quad x=\pm\sqrt{6}$

4) $x^3 + 125 = 0$

$(x+5)(x^2-5x+25)=0$

$x=-5 \quad \frac{5\pm\sqrt{25-4(25)}}{2}=\frac{5\pm\sqrt{-75}}{2}$

$x=\frac{5\pm5i\sqrt{3}}{2}$

5) $2r - 50r^5 = 0$

$2r(1-25r^4)=0$

$2r(1-5r^2)(1+5r^2)=0$

$2r=0 \quad 1-5r^2=0 \quad 1+5r^2=0$

$r=0 \quad 1=5r^2 \quad 1=-5r^2$

$\frac{1}{5}=r^2 \quad -\frac{1}{5}=r^2$

$\pm\sqrt{\frac{1}{5}}=r \quad \pm i\sqrt{\frac{1}{5}}=r$

or $\pm\frac{\sqrt{5}}{5}$ or $\pm i\frac{\sqrt{5}}{5}$

6) $x^4 - 8x = 0$

$x(x^3-8)=0$

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

$x=0 \quad x=2$

$\frac{-2\pm\sqrt{4-4(4)}}{2}$

$=\frac{-2\pm\sqrt{-12}}{2}$ (4, 3)

$=\frac{-2\pm2i\sqrt{3}}{2}$

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