

$$\textcircled{1} \quad \underbrace{x^4}_{u^2} - 5\underbrace{x^2}_u - 36 = 0$$

$$u^2 - 5u - 36 = 0$$

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

$$u-9=0 \quad u+4=0$$

$$u=9 \quad u=-4$$

$$x^2=9 \quad x^2=4$$

$$x = \pm\sqrt{9} \quad x = \pm\sqrt{4}$$

$$\boxed{x = \pm 3} \quad \boxed{x = \pm 2}$$

"U-SUBSTITUTION"

$$(x^2)^2 = x^4$$

STEP 1: LET THE VARIABLE PART OF MIDDLE BE U AND VARIABLE PART OF FIRST BE U^2

STEP 2: SOLVE FOR U

STEP 3: PLUG $u = \underline{\quad}$ BACK IN AND SOLVE FOR X

$$\textcircled{2} \quad \underbrace{(x+5)^2}_{u^2} - 3\underbrace{(x+5)}_u - 28 = 0$$

$$u^2 - 3u - 28 = 0$$

PSD

$$(u-7)(u+4) = 0$$

$$u-7=0 \quad u+4=0$$

$$u=7 \quad u=-4$$

$$x+5=7$$

$$x=7-5$$

$$\boxed{x=-2}$$

$$x+5=-4$$

$$x=-4-5$$

$$\boxed{x=-9}$$

$$\textcircled{3} \quad \underbrace{x}_{u^2} - 6\underbrace{\sqrt{x}}_u - 16 = 0$$

$$u^2 - 6u - 16 = 0$$

PSD

$$(u-8)(u+2) = 0$$

$$u-8=0 \quad u+2=0$$

$$u=8 \quad u=-2$$

$$(\sqrt{x})^2 = x$$

$$\sqrt{x}=8$$

$$\sqrt{x}=-2$$

$$(\sqrt{x})^2 = 8^2$$

$$\boxed{x=64}$$

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

$$\cancel{x=4}$$

$$\textcircled{4} \quad 14a^{-2} + 19a^{-1} = 3$$

$$14\underbrace{a^{-2}}_{u^2} + 19\underbrace{a^{-1}}_u - 3 = 0$$

$$14u^2 + 19u - 3 = 0$$

$$(7u-1)(2u+3) = 0$$

$$7u-1=0 \quad 2u+3=0$$

$$7u=1 \quad 2u=-3$$

$$\frac{7u}{7} = \frac{1}{7} \quad \frac{2u}{2} = \frac{-3}{2}$$

$$u = \frac{1}{7} \quad u = -\frac{3}{2}$$

$$a^{-1} = \frac{1}{7}$$

$$\boxed{a^{-1} = \frac{1}{7}}$$

$$\frac{1}{a^1} = \frac{1}{7}$$

$$\frac{a}{1} = \frac{7}{1}$$

$$\boxed{a=7}$$

$$a^{-1} = -\frac{3}{2}$$

$$\boxed{a^{-1} = -\frac{3}{2}}$$

$$\frac{1}{a^1} = -\frac{3}{2}$$

$$\frac{a}{1} = \frac{2}{-3}$$

$$\boxed{a = -\frac{2}{3}}$$

KEY #