

# 10 Classwork 10 MAT 1275 Professor Chiu

Name: \_\_\_\_\_

1. Solve

①  $11 = (\pm\sqrt{11})^2$

② Cancel "square" by  $\sqrt{\quad}$

③ isolate "x"

$$(x-3)^2 = 11$$

$$\Rightarrow (x-3)^2 = (\pm\sqrt{11})^2$$

$$\Rightarrow \sqrt{(x-3)^2} = \sqrt{(\pm\sqrt{11})^2} \Rightarrow (x-3) = \pm\sqrt{11}$$

$$\Rightarrow \underbrace{(x-3)}_{+3} = \pm\sqrt{11} \quad \rightarrow \quad \boxed{x = 3 \pm \sqrt{11}}$$

2. Solve

① Complete the square:

$$x^2 - 6x - 2 = 0$$

$(x+a)^2 = x^2 + 2ax + a^2$   
 Given  $x^2 - 6x$ , find a constant " $a^2$ " that "complete" it:  $x^2 - 6x + a^2$   
 $\Rightarrow 2a = -6 \Rightarrow a = -3$   
 $\Rightarrow a^2 = (-3)^2 = 9$   
 and  $x^2 - 6x + 9 = (x-3)^2$

$$\Rightarrow \boxed{x^2 - 6x + 9} - 2 = 0 + 9$$

$$\Rightarrow \frac{(x-3)^2 - 2}{+2 \quad +2} = \frac{0 + 9}{+2 \quad +2}$$

$$(x-3)^2 = 11$$

$$\Rightarrow (x-3)^2 = 11 = (\pm\sqrt{11})^2$$

$$\Rightarrow \sqrt{(x-3)^2} = \sqrt{(\pm\sqrt{11})^2}$$

$$\Rightarrow x-3 = \pm\sqrt{11} \Rightarrow \boxed{x = 3 \pm \sqrt{11}}$$

3. Solve

① Simplify RHS and LHS:

$$3x^2 + 3x - 7x = 6$$

$$\Rightarrow 3x^2 - 4x = 6$$

$$\underline{3x^2 - 4x - 6 = 0}$$

$$A=3, B=-4, C=-6$$

② Given  $Ax^2+Bx+C=0$  and solve for x:

Quadrature formula

$$x = \frac{-B \pm \sqrt{B^2 - 4AC}}{2A}$$

$$x = \frac{4 \pm \sqrt{16 - 4 \cdot (3) \cdot (-6)}}{6}$$

$16 + 72 = 88$   
 $88 = 2^2 \cdot 2 \cdot 11$   
 $\sqrt{88} = 2 \cdot \sqrt{22}$

$$= \frac{4 \pm \sqrt{88}}{6} = \frac{4 \pm 2\sqrt{22}}{6}$$

GCF

$$= \frac{\cancel{2} (2 \pm \sqrt{22})}{\cancel{6} 3} = \boxed{\frac{2 \pm \sqrt{22}}{3}}$$