40/50

1.) $x^2 - 7x - 18 = 0$

$a = 1 \quad b = -7 \quad c = -18$

$$x = \frac{7 \pm \sqrt{49 + 72}}{2}$$

$$x = \frac{7 \pm \sqrt{121}}{2}$$

5

$$x = \frac{7+11}{2} =$$

$$x = 7 - 11 =$$

$$\boxed{x_1 = -2 \quad x_2 = 9}$$

2.) $3.62x^2 - 9.71x - 15.68 = 0$

* Times by 100

$a = 362 \quad b = -971 \quad c = -1,568$

$$x = \frac{-(971) \pm \sqrt{(-971)^2 - 4(362)(-1.568)}}{724}$$

$$x_1 = \frac{971 \pm \sqrt{971 + 2270464}}{724} \qquad x_2 = \frac{971 - \sqrt{971^2 + 2270464}}{724}$$

$$\boxed{x_1 = -1.1348 \quad x_2 = 3.8171}$$

4

MAT 121 wp #1

3.) $2x^2 - 6x + 7 = 0$

$a = 2 \quad b = -6 \quad c = 7$

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(2)(7)}}{4}$$

$$x = \frac{6 \pm \sqrt{36 - 56}}{4}$$

$$x = \frac{6 \pm \sqrt{-20}}{4}$$

$x = \mathbb{R}$ No

Yes

3,5

$b^2 - 4ac = (-6)^2 - 4(2)(7)$

$= 36 - 56 = -20$

$\sqrt{-20} = 2i\sqrt{5}$

2 | 20
2 | 10
5

$$x = \frac{-(-6) \pm 2i\sqrt{5}}{2(2)}$$

$$= \frac{6 \pm 2i\sqrt{5}}{4} = \frac{2(3 \pm i\sqrt{5})}{4}$$

$$= \boxed{\frac{3 \pm i\sqrt{5}}{2} = x}$$

4.) $dx^2 + 3wx - 8\pi = 0$

$a = d \quad b = 3w \quad c = -8\pi$

$$x = \frac{-3w \pm \sqrt{(3w)^2 - 4d(-8)(\pi)}}{2d}$$

$\pm$

$$x = \frac{3w + \sqrt{9w^2 + 32d\pi}}{2d}$$

$$x = \frac{-3w \pm \sqrt{9w^2 + 32d\pi}}{2d}$$

4,7

MAT 121 wp #1

5.) $x^2 - 4x - 77 = 0$

$x^2 + 7x - 11x - 77 = 0$ → NO → No

$x(x+7) - 11(x+7) - 77 = 0$

$(x+7)(x-11) = 0$

$x^2 + 7x - 11x - 77$

$= x^2(x+7) - 11(x+7)$

$= (x+7)(x-11)$

4

$x+7 = 0$
$x - 11 = 0$ =

$x_1 = -7$
$x_2 = 11$

6.) $28x^2 - 100x + 75 = 0$ → Show scratch! how you found $-30x - 70x$

$\frac{28x^2}{2} - \frac{30x}{2} - 70x + 75 = 0$

$2x(14x - 15) - 5(14x - 15) = 0$

$14x - 15 = 0$
$2x - 5 = 0$

$x_1 = \frac{15}{14}$

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

4

MAT 121 wp #1

7.) $x^2 + 6x - 15 = 0$
$+15 \quad +15$

$x^2 + 6x = 15 \rightarrow (x+3^2) = 9$

$x^2 + 6x + 9 = 15 + 9$

$(x+3)^2 = 24$

$x_1 = -2\sqrt{6} - 3$
$x_2 = 2\sqrt{6} - 3$

3.5

skipping key steps

$(x+3)^2 = 24$

$x+3 = \pm\sqrt{24}$

$x = -3 \pm 2\sqrt{6}$

2 | 24
2 | 12
2 | 6
3
$2\sqrt{6}$

8.) $x^2 - 5x - 11 = 0$

$x^2 - 5x = 11$

$x^2 - 5x + \frac{25}{4} = (x - \frac{5}{2})^2$

$x^2 - 5x + \frac{25}{4} = 11 + \frac{25}{4} = \frac{44}{4} + \frac{25}{4} = \frac{69}{4}$ Show

$(x - \frac{5}{2})^2 = \frac{69}{4}$

4

$x_1 = \frac{-\sqrt{69} + 5}{2}$

$x_2 = \frac{\sqrt{69} + 5}{2}$

MAT 121 WP #1

1.) $2x^2+3x-7=0$
$+7 \quad +7$

$\frac{2x^2+3x=7}{2}$

$x^2+\frac{3}{2}x=\frac{7}{2}$

$x^2+\frac{3}{2}x+\frac{9}{16}=\frac{7}{2}+\frac{9}{16}$

$(x+\frac{3}{4})^2=\frac{65}{16}$

$x_1=-\frac{\sqrt{65}+3}{4}$

$x_2=\frac{\sqrt{65}-3}{4}$

$x^2+\frac{3}{2}x+(\frac{3}{4})^2=\frac{7}{2}+\frac{9}{16}=\frac{56+9}{16}$

Not showing steps, so mistakes cost more.

$(x+\frac{3}{4})^2=\frac{65}{16}$

$x+\frac{3}{4}=\pm\sqrt{\frac{65}{16}}=\pm\frac{\sqrt{65}}{4}$

$x=\frac{-3\pm\sqrt{65}}{4}$ 3

No, $x=\frac{\sqrt{65}+3}{4}$; OK

$x=\frac{-\sqrt{65}+3}{4}$; the other soln

10.) $5x^2-4x+23=0$
$-23 \quad -23$

$\frac{5x^2-4x=-23}{5}$

$x^2-\frac{4}{5}x=-\frac{23}{15}$ → No

$x^2-\frac{4}{5}x+\frac{4}{25}=-\frac{23}{5}+\frac{4}{25}$

$(x-\frac{2}{5})^2=-\frac{111}{25}$

No $x^2-\frac{4}{5}x+(\frac{2}{5})^2=-\frac{23}{5}+\frac{4}{25}$

$\frac{1}{25}\quad\frac{-115+4}{25}$

$=\frac{-111}{4}$

$x=\mathbb{R}$

No.

3.5

The solutions are nonreal complex. Show them