Unit 2 More Review!

1. Factor completely: $x^5 - 7x^4 + 10x^3$

$x^3(x^2 - 7x + 10)$ * GCF

$x^3(x-2)(x-5)$ * Trinomial

2. Solve for x: $-4 = -x + \sqrt{2x - 8}$

$+x \quad +x$

$(x-4)^2 = (\sqrt{2x-8})^2$

$x^2 - 8x + 16 = 2x - 8$

$x^2 - 10x + 24 = 0$

Factor
Formula
CTS
Graph

$(x-4)(x-6) = 0$

$x = 4$	$x = 6$

$\{4, 6\}$

3. Solve $2x^2 + 16x + 56 = 0$ by completing the square and express the result in simplest $a + bi$ form.

$\div 2$

$x^2 + 8x + 28 = 0$

$x^2 + 8x \underline{+16} = -28 \underline{+16}$

$\sqrt{(x+4)^2} = \pm\sqrt{-12}$

$x + 4 = \pm 2i\sqrt{3}$

$x = -4 \pm 2i\sqrt{3}$

4. Determine the center and the radius of $x^2 + y^2 - 8x - 2y + 16 = 0$

$x^2 - 8x \underline{+16} + y^2 - 2y \underline{+1} = -16 \underline{+16} \underline{+1}$

$(x-4)^2 + (y-1)^2 = 1$

Center $(4, 1)$ radius $= \sqrt{1} = 1$

5. Convert the following quadratic into vertex form: $y = x^2 + 2x - 1$

* Look on calculator
vertex $(-1, -2)$

$y + 1 \underline{+1} = x^2 + 2x \underline{+1}$

$y + 2 = (x+1)^2$

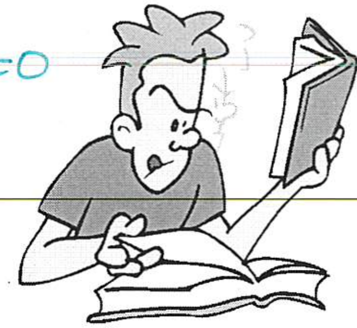
$y = (x+1)^2 - 2$

6. Factor completely: $x^6 - 4x^2$

$x^2(x^4 - 4)$ * GCF

$x^2(x^2+2)(x^2-2)$ * DOTS

7. *Solve for x*: $-3 = \sqrt{37-3x} - x$



$+x \quad +x$

$(x-3)^2 = (\sqrt{37-3x})^2$

$x^2 - 6x + 9 = 37 - 3x$

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

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

$x = 7 \quad x = -4$

$\{7\}$

8. Determine the roots of the equation in simplest radical form: $5x^2 + 20x - 60 = 0$

$a = 5$

$b = 20$

$c = -60$

$$x = \frac{-20 \pm \sqrt{(20)^2 - 4(5)(-60)}}{2(5)}$$

$$x = \frac{-20 \pm \sqrt{1600}}{10}$$

$$x = \frac{-20 \pm 40}{10}$$

$$x = \frac{-20+40}{10} = \frac{20}{10} = 2$$

$$x = \frac{-20-40}{10} = \frac{-60}{10} = -6$$

9. Rewrite in vertex form: $y = x^2 + 16x + 71$

Vertex $(-8, 7)$

$y - 71 + 64 = x^2 + 16x + 64$

$y - 7 = (x+8)^2$

$y = (x+8)^2 + 7$

10. Determine all zeros of the function: $3x^4 + 9x^2 - 6x^3 - 18x = y$

4 roots

$(3x^4 + 9x^2) + (-6x^3 - 18x) = 0$

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

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

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

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

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

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

* 2 real roots, 2 imag. roots

11. Factor completely: $x^3 - 5x^2 - x + 5$

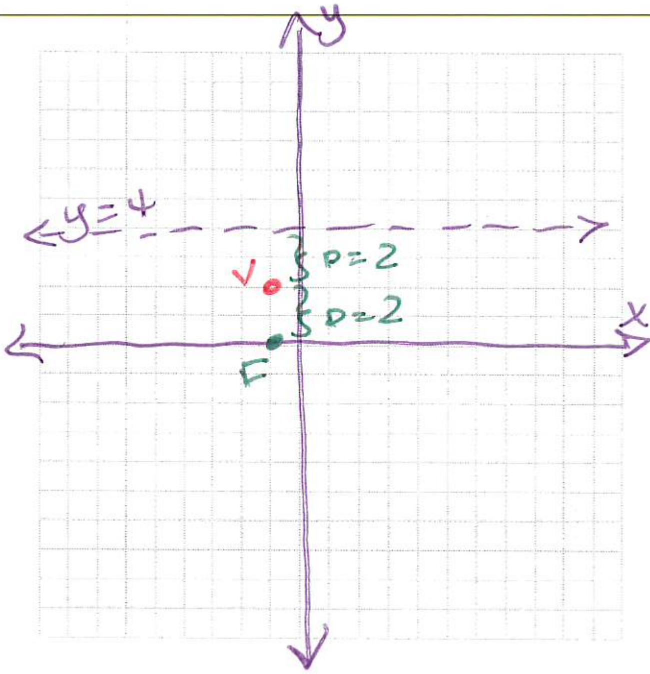
$(x^3 - 5x^2) + (-x + 5)$

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

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

$(x+1)(x-1)(x-5)$

12. The directrix of the parabola $-8(y-2) = (x+1)^2$ has the equation $y = 4$. Find the coordinates of the focus of the parabola. ***(*The use of the grid is optional)***



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

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

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

a is negative

$$\frac{1}{4p} = \frac{1}{8}$$

Vertex $(-1,2)$

$$p = 2$$

$\boxed{\text{Focus } (-1,0)}$