1. a02e00 - Racionaliza:

   (a) $\dfrac{\sqrt{5}-2}{2+\sqrt{5}}$

   Sol: $9-4\sqrt{5}$

   Sol: $-11-6\sqrt{2}$

   (b) $\dfrac{42+14\sqrt{2}}{2\sqrt{2}-6}$

2. a02e01 - Aplica la definición de logaritmo para calcular:

   (a) $\log_{25} 5$

   Sol: $\frac{1}{2}$

   (b) $\log_{0,5} 1/8$

   Sol: 3

   Sol: -5

   (c) $\log_{0,5} 32$

3. a02e02 - Halla el valor de k para que la siguiente división sea exacta:

   (a) $\left(3x^2+kx-15\right):(x-3)$

   Sol: $3k+12=0 \to k=-4$

   Sol: $8k-24=0 \to k=3$

   (b) $\left(kx^3-6x^2+7x-14\right):(x-2)$

4. a02e03 - Factoriza:

   (a) $4x^5-12x^4+13x^3-6x^2+x$

   Sol: $x\,(x-1)^2\,(2x-1)^2$

   (c) $x^3-11x^2+40x-48$

   Sol: $(x-4)^2\,(x-3)$

   (b) $4x^4-24x^3+21x^2-5x$

   Sol: $x\,(x-5)\,(2x-1)^2$

   (d) $8x^4-62x^3+139x^2-79x+12$

   Sol: $(x-4)\,(x-3)\,(2x-1)\,(4x-1)$

5. a02e04 - Simplifica la siguiente fracción algebraica:

   (a) $\dfrac{2x^3-x^2-6x}{x^3-2x^2}$

   Sol: $\frac{2x^3-x^2-6x}{x^3-2x^2}=\frac{x(x-2)(2x+3)}{x^2(x-2)}=\frac{2x+3}{x}$

   (b) $\dfrac{2x^4-12x^3+24x^2-16x}{6x^4-36x^3+72x^2-48x}$

Sol: $\frac{2x^4-12x^3+24x^2-16x}{6x^4-36x^3+72x^2-48x} = \frac{2x(x-2)^3}{6x(x-2)^3} = \frac{1}{3}$

6. a01e05 - Resuelve las siguientes ecuaciones

(a) $4x^5 - 12x^4 + 13x^3 - 6x^2 + x = 0$

Sol: $4x^5-12x^4+13x^3-6x^2+x = 0 \to x\left(x-1\right)^2\left(2x-1\right)^2 = 0 \to x = 0, x = \frac{1}{2}, x = 1$

(b) $x^3 - 11x^2 + 40x - 48 = 0$

Sol: $x^3 - 11x^2 + 40x - 48 = 0 \to \left(x-4\right)^2\left(x-3\right) = 0 \to x = 3, x = 4$

(c) $3\sqrt{x-1} + 11 = 2x$

Sol: $3\sqrt{x-1} + 11 = 2x \to x = 10$

(d) $\sqrt{x} + \sqrt{x-4} = 2$

Sol: $\sqrt{x} + \sqrt{x-4} = 2 \to x = 4$

(e) $\dfrac{x+1}{x-1} - \dfrac{1}{x} = \dfrac{5}{2}$

Sol: $\frac{x+1}{x-1} - \frac{1}{x} = \frac{5}{2} \to \frac{x^2+1}{x(x-1)} = \frac{5}{2} \to \frac{2}{x(x-1)} = \frac{5}{x^2+1} \to \frac{2}{x(x-1)} = \frac{5}{x^2+1} \to \frac{2}{x^2-x} = \frac{5}{x^2+1} \to 2\left(x^2+1\right) = 5\left(x^2-x\right) \to 2\left(x^2+1\right) - 5\left(x^2-x\right) = 0 \to -3x^2+5x+2 = 0 \to x = -\frac{1}{3}, x = 2$

(f) $2^{x+1} + 2^{x-1} = 20$

Sol: $x = 3$

(g) $2^{x-1} + 2^{x-2} + 2^{x-3} = 224$

Sol: $x = 8$

(h) $\log 2 + \log x = 1$

Sol: $x = 5$

(i) $5\log x - \log 32 = \log \frac{x}{2}$

Sol: $x = 2$