EJERCICIOS DE PRIMER PARCIAL RESUELTO

RESOLUCIÓN 1P - Verano 23 $\boxed{\#1}$

1) $(3x^2-5x-2)(-3x+12)=0$

$$3x^2-5x-2=0 \quad \vee \quad -3x+12=0$$

$$-3x=-12$$

$$3x=12$$

$$\boxed{x=4}$$

$$x=\frac{5\pm\sqrt{25-4.3(-2)}}{2.3}=\frac{5\pm\sqrt{25+24}}{6}=\frac{5\pm\sqrt{49}}{6}=\frac{5\pm7}{6}=\begin{cases}=\frac{5+7}{6}=\frac{12}{6}=2\\ =\frac{5-7}{6}=\frac{-2}{6}=-\frac{1}{3}\end{cases}$$

$$x=2 \vee x=-\frac{1}{3} \vee x=4$$

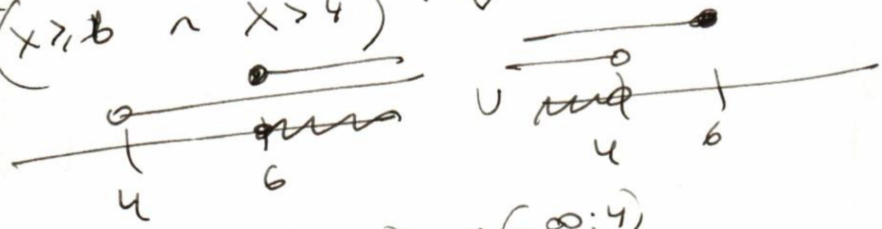
$$\boxed{S=\{2;-\tfrac{1}{3},4\}}$$

2) $\frac{2x-12}{4x-16} \geq 0$

$(2x-12 \geq 0 \wedge 4x-16>0) \vee (2x-12 \leq 0 \wedge 4x-16<0)$

$(2x \geq 12 \wedge 4x>16) \vee (2x \leq 12 \wedge 4x<16)$

$(x \geq 6 \wedge x>4) \vee (x \leq 6 \wedge x<4)$



$S = [6;+\infty) \cup (-\infty;4)$

$\boxed{S = (-\infty;4) \cup [6;+\infty)}$

3) $\left(a^2 b^4 \sqrt[5]{a^4 b^2}\right)\left(a^3 b^5 \sqrt[3]{a\, b^2}\right)$ $\boxed{H2}$

$= \sqrt[5]{a^{10} b^{20} a^4 b^2} \; \sqrt[3]{a^9 b^{15} a\, b^2} =$

$= \sqrt[5]{a^{14} b^{22}} \; \sqrt[3]{a^{10} b^{17}} =$

$= \sqrt[5\times 3]{a^{14\times 3}\, b^{22\times 3}} \; \sqrt[3\times 5]{a^{10\times 5}\, b^{17\times 5}} =$

$= \sqrt[15]{a^{42} b^{66}} \; \sqrt[15]{a^{50} b^{85}}$

$= \sqrt[15]{a^{42} b^{66} a^{50} b^{85}} = \sqrt[15]{a^{92} b^{151}} =$

$= a^6 b^{10} \sqrt[15]{a^2\, b^1}$

$$\begin{array}{r|l} 92 & 15 \\ \hline 2 & 6 \\ 0 & \end{array} \qquad \begin{array}{r|l} 151 & 15 \\ \hline 1 & 10 \\ 0 & \end{array}$$

---

4) L: $m = -\frac{1}{2}$; $b = 4$ $x_{izq} = 0$. $x_{DER} = 8$

L: $y = -\frac{1}{2}x + 4$ $(0 \le x \le 8)$

$\mathcal{E}$: $x_0 = 4$; $y_0 = 5$; $a = 3$; $b = 2$ completa

$$\frac{(x-4)^2}{3^2} + \frac{(y-5)^2}{2^2} = 1$$

---

o bien $x = 4 + 3\cos(t)$ $(0 \le t \le 2\pi)$

$y = 5 + 2\,\mathrm{sen}(t)$

$\boxed{P}$ $x_v = 4$; $y_v = -4{,}5$ $x_1 = 1$, $\boxed{H3}$

$x_2 = 7$

$y = a(x-1)(x-7)$

Pero $(4; 4.5) \in P$

$\Updownarrow$

4; 4.5 verifican $y = a(x-1)(x-7)$

$\Updownarrow$

$4.5 = \frac{9}{2} = a(4-1)(4-7)$

$\frac{9}{2} = a\ 3.-3$

$\frac{9}{2} = -9a$

$-\frac{9}{2\,9} = a = \boxed{-\frac{1}{2}}$

$P: y = -\frac{1}{2}(x-1)(x-7)$

o bien

$y = -\frac{1}{2}(x-4)^2 - 4.5$

---

5) a) $(1-3i)(4+2i) = 4 + 2i - 12i \underbrace{-6i^2}_{+6} =$

$= 10 - 10i$

b) $\frac{2+4i}{5-i} = \frac{(2+4i)}{(5-i)}\frac{(5+i)}{(5+i)} = \frac{10+2i+20i+\overbrace{4i^2}^{-4}}{25+1}$

$= \frac{6+22i}{26} = \frac{6}{26} + \frac{22}{26}i = \boxed{\frac{3}{13} + \frac{11}{13}i}$

c) $\{3[\cos(40°) + i\,\mathrm{sen}(40°)]\}^4 = 3^4[\cos(4\times 40°) + i\,\mathrm{sen}(4\times 40°)]$

$= 81\ (\cos 160° + i\,\mathrm{sen}\,160°)$

d) $\dfrac{14\ \text{cis}\ 80^\circ}{7\ \text{cis}\ 30^\circ} = \dfrac{14}{7}\ \text{cis}\ (80^\circ - 30^\circ) =$ $\boxed{\#4}$

$= 2\ \text{cis}\ 50^\circ = 2(\cos 50^\circ + i\ \text{sen}\ 50^\circ)$