

$$\begin{aligned}
 1) \text{ i - } x^2 + 8x + 15 &= 0 \\
 &= (x+3)(x+5) = 0 \\
 &= x+3=0 \wedge x+5=0 \\
 &= \boxed{x=-3} \wedge \boxed{x=-5}
 \end{aligned}$$

$$\begin{aligned}
 \text{ii - } x^2 - 225 &= 0 \\
 &= (x-15)(x+15) = 0 \\
 &= \boxed{x=15} \wedge \boxed{x=-15}
 \end{aligned}$$

$$\begin{aligned}
 \text{iii - } x^2 + 11x + 30 &= 0 \\
 &= (x+6)(x+5) = 0 \\
 &= x+6=0 \wedge x+5=0 \\
 &= \boxed{x=-6} \wedge \boxed{x=-5}
 \end{aligned}$$

$$\begin{aligned}
 \text{iv - } x^2 - 6x + 8 &= 0 \\
 &= (x-4)(x-2) = 0 \\
 &= x-4=0 \wedge x-2=0 \\
 &= \boxed{x=4} \wedge \boxed{x=2}
 \end{aligned}$$

$$\begin{aligned}
 \text{v - } 2x^2 + 9x + 7 &= 0 \\
 &= (2x+7)(x+1) = 0 \\
 &= 2x+7=0 \wedge x+1=0 \\
 &= \boxed{x=3,5} \wedge \boxed{x=-1}
 \end{aligned}$$

$$\begin{aligned}
 2) \quad 12x^2 + 5x &= -7 \\
 &= x = \frac{-5 \pm \sqrt{5^2 - 4 \times 12 \times (-7)}}{2 \times 12} \\
 &= x = \frac{-5 \pm \sqrt{361}}{24} \\
 &= x = \frac{-5 + \sqrt{361}}{24} \wedge x = \frac{-5 - \sqrt{361}}{24} \\
 &= \boxed{x \approx 0,58} \wedge \boxed{x = -1}
 \end{aligned}$$

3) $5x + 2y = 22$ ①

$4x + 3y = 19$ ②

$15x + 6y = 66$ ③

$8x + 6y = 38$ ④

③-④

$7x = 28$

$x = \frac{28}{7}$

$\rightarrow x = 4$

② - $4(4) + 3y = 19$

$16 + 3y = 19$

$3y = 3$

$\rightarrow y = 1$

4) i - $x^8 x x' x x^9$
 x^{18}

ii - $(2x^3)^3$
 $2x^9$

iii - $\frac{x^{12} x x^8}{x}$
 $\frac{x^{20}}{x}$
 x^{19}

iv - $\frac{5x^2}{1(3)} + \frac{3x^4}{1(5)}$
 $\frac{15x^2}{15} + \frac{15x^4}{15}$
 $15x^6$

v - $\frac{10x^5}{2x^2}$
 $5x^{5-2}$
 $5x^3$

$$5) i \quad 2(x^2 + y^2) + x^2(x - y) + 3xy - x^3$$

$$2x^2 + 2y^2 + x^3 - x^2y + 3xy - x^3$$

$$2x^2 + 2y^2 - x^2y + 3xy$$

$$6) i - 5(2x + 1) = 4(3x + 2)$$

$$\Rightarrow 10x + 5 = 12x + 8$$

$$\Rightarrow -2x = 3$$

$$\Rightarrow \boxed{x = -1.5}$$

$$ii - 12x + 5 = 4x - 1$$

$$\Rightarrow 8x = -6$$

$$\Rightarrow \boxed{x = -0.75}$$

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

$$\Rightarrow 8x - 2 = 15x + 6$$

$$\Rightarrow -7x = 8$$

$$\Rightarrow x \approx -1.14$$

$$7) i - \text{ANGLE B}$$

$$\cos^{-1}\left(\frac{5}{8}\right) \approx \boxed{51.32^\circ}$$

$$ii - \text{ANGLE C}$$

$$\sin^{-1}\left(\frac{5}{8}\right) \approx \boxed{38.68^\circ}$$

$$iii - \text{LENGTH AC}$$

$$\sin 51.32^\circ = \frac{AC}{8}$$

$$\Rightarrow \boxed{AC \approx 6.25m}$$