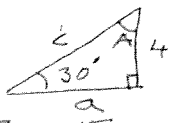


$$\textcircled{1} \sin 30^\circ = \frac{4}{c}, \quad c = \frac{4}{1/2} = 8$$

Pythagoras ger $a^2 + 4^2 = 8^2$

$$\text{Dvs } a^2 = 64 - 16 = 48, \quad a = \sqrt{48} = \sqrt{3 \cdot 16} = 4\sqrt{3}$$

$$A = 90^\circ - 30^\circ = 60^\circ$$



$$\textcircled{2} a) 2x^2 - 2x + 1 = 2(x^2 - x + \frac{1}{2}) = 2((x - \frac{1}{2})^2 - \frac{1}{4} + \frac{1}{2}) = 2(x - \frac{1}{2})^2 + \frac{1}{2}$$

Minsta värde $= \frac{1}{2}$

$$b) 2(z - \frac{1}{2})^2 + \frac{1}{2} = 0 \Leftrightarrow (z - \frac{1}{2})^2 = -\frac{1}{4}$$

$$z - \frac{1}{2} = \pm \frac{1}{2} \quad \text{och} \quad z = \frac{1}{2} \pm \frac{1}{2}$$

$$\textcircled{3} a) 2(1, -2) - (3, -1) = (-1, -3) \text{ så}$$

$$|2u - v| = |(-1, -3)| = \sqrt{(-1)^2 + (-3)^2} = \sqrt{10}$$

$$b) 0 = (xu - v) \cdot (u) = ((x - 2x) - (3, -1)) \cdot (1, -2) =$$

$$= (x - 3, -2x + 1) \cdot (1, -2) = (x - 3) \cdot 1 + (-2x + 1) \cdot (-2) =$$

$$= x - 3 + 4x - 2 = 5x - 5. \quad x = 1$$

$$\textcircled{4} a) |(-2 + 3i) + (1 + \frac{1}{2}i)| = |(-2 + 3i) + (1 + \frac{1}{2}i)| =$$

$$= |-1 + \frac{5}{2}i| = \sqrt{(-1)^2 + (\frac{5}{2})^2} = \frac{\sqrt{29}}{2}$$

$$b) \frac{(-2 + 3i) + (2 + i)}{1 - \frac{1}{2}} = \frac{8i}{2 - i} = \frac{8i(2 + i)}{(2 - i)(2 + i)} =$$

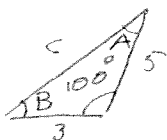
$$= \frac{16i + 8i^2}{4 - i^2} = \frac{-8 + 16i}{5}$$

$$\textcircled{5} \text{Cosinussatsen ger}$$

$$c^2 = 3^2 + 5^2 - 2 \cdot 3 \cdot 5 \cdot \cos 100^\circ \approx$$

$$\approx 9 + 25 + 30 \cdot 0,17 = 39,1$$

$$c \approx \sqrt{39,1} \approx 6,25$$



vänd

(forts.) cosinussatsen igen

$$5^2 = c^2 + 3^2 - 2 \cdot 3 \cdot c \cdot \cos B$$

$$\cos B = -\frac{25 - 9 - 39,1}{6 \cdot 6,25} = \frac{23,1}{37,5} = 0,616$$

$$B = \arccos 0,616 \approx 52,0^\circ, \quad A \approx 180^\circ - 100^\circ - 52^\circ = 28,0^\circ$$

$$\textcircled{6} a) \frac{4x^2y^2 \cdot \frac{y^3}{8x^3}}{2 \frac{y^2}{x}} = \frac{2x^2y^5}{8 \cdot y^2x^3/x} = \frac{y^3}{4}$$

$$b) \frac{a^3 - ab^2}{a^2 + ab} = \frac{a(a^2 - b^2)}{a(a + b)} = \frac{(a + b)(a - b)}{a + b} = a - b$$

$$\textcircled{7} a) \tan \frac{x}{2} = -1 \Leftrightarrow \frac{x}{2} = -\frac{\pi}{4} + n \cdot \pi$$

$$\text{Dvs } x = -\frac{\pi}{2} + n \cdot 2\pi$$

$$b) \arctan \frac{x}{2} = -1 \Rightarrow \frac{x}{2} = -\tan 1, \quad x = -2 \tan 1 \approx$$

$$\approx -2 \cdot 1,56 = -3,12$$



$$\textcircled{8} \text{Faktorisera nämnaren } x^3 + 3x^2 + 2x = x(x^2 + 3x + 2)$$

$$x^2 + 3x + 2 = 0 \text{ ger } x = -\frac{3}{2} \pm \sqrt{\frac{9}{4} - \frac{8}{4}} = \frac{-3 \pm 1}{2} = \begin{cases} -1 \\ -2 \end{cases}$$

$$\text{Dvs nämnaren} = x(x + 1)(x + 2)$$

$$\text{Ansätt } \frac{x^2 + x - 1}{x(x + 1)(x + 2)} = \frac{a}{x} + \frac{b}{x + 1} + \frac{c}{x + 2}$$

Multiplitera med nämnaren:

$$x^2 + x - 1 = a(x + 1)(x + 2) + b x(x + 2) + c x(x + 1)$$

$$x = 0 \text{ ger } -1 = 2a, \quad a = -\frac{1}{2}$$

$$x = -1 \text{ ger } -1 = -b, \quad b = 1$$

$$x = -2 \text{ ger } 1 = 2c, \quad c = \frac{1}{2}$$

$$\frac{x^2 + x - 1}{x^3 + 3x^2 + 2x} = \frac{-\frac{1}{2}}{x} + \frac{1}{x + 1} - \frac{1}{2x}$$

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