1.6. Other types of Equations Monday, January 29, 2018 10:58 Obj 1: Solve polynomial equations by factoring. E.g. $3x^4 - 48x^2 = 0$. $3x^{2}\left(x^{2}-16\right)=0$ $3x^{2}(x+4)(x-4)=0$ Either $3x^2 = 0$ or x + 4 = 0 or x - 4 = 0 $x = 0 \qquad x = -4 \qquad x = 4$ Solution set: {0, -4, 4} E.g. Solve for x $3x^{3} + 2x^{2} = 12x + 8$ $\frac{3x^{3} + 2x^{2} - 12x - 8}{x^{2}(3x + 2) - 4(3x + 2)} = 0$

 $(3_{x+2})\cdot(x^2-4)=0$ $(3x+2) \cdot (x+2)(x-2) = 0$ Either 3x+2=0 on x+2=0 or x - 2 = 0 $x = -\frac{2}{3}$ x = -2x = 2 Solution set: $\{-\frac{2}{2}, -2, 2\}$. Obj 2: Solve nadical equations <u>E.g.</u> $\sqrt{2x+13} = x+7$. $\left(\sqrt{2x+13}\right)^{2} = (x+7)^{2} (x+7)(x+7)$ $= x^{2} + 14x + 49$ 2x + 13 $= x^{2} + 12x(+36)$ O $=(x+6)^{2}$ \bigcirc

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$$x+6 = 0 ; x = -6$$

(leck solution $x = -6$:
Plug $x = -6$ into the original equation.

$$\frac{2 \cdot (-6) + 13}{2} = -6 + 7$$

$$\frac{7}{2} = 1$$

So, $x = -6$ is a solution to the original equation
Solution sot: $\{-6\}$.

$$= -6$$

Solution sot: $\{-6\}$.

$$= -3$$

Square both sides:

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

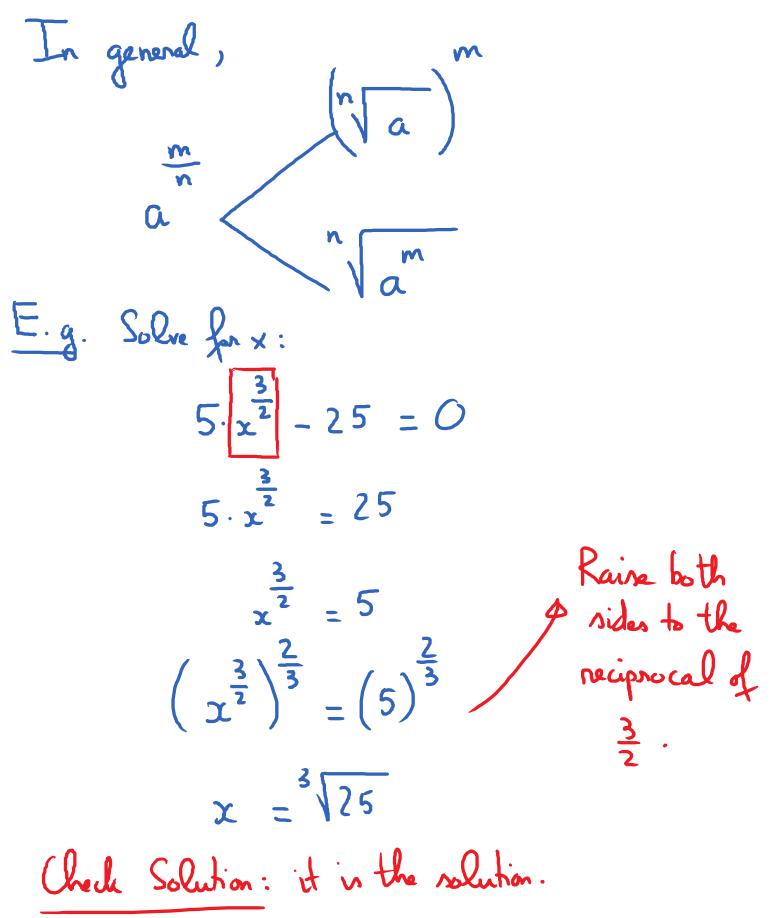
 $= x^{2} - 6x + 9$ $\chi + 3$ $= x^2 - 7x + 6$ ()= (x - 1)(x - 6)0 or x - 6 \bigcirc = 0 $\times -1$ x = 61 × Gr 1 Check solutions: メモ x + 3 + 3 a solution. ? 3 aneow 4 3 2 5 ŧ + 3 = 6 6 + 3 X=6 is a solution 19 3?=6 3+3

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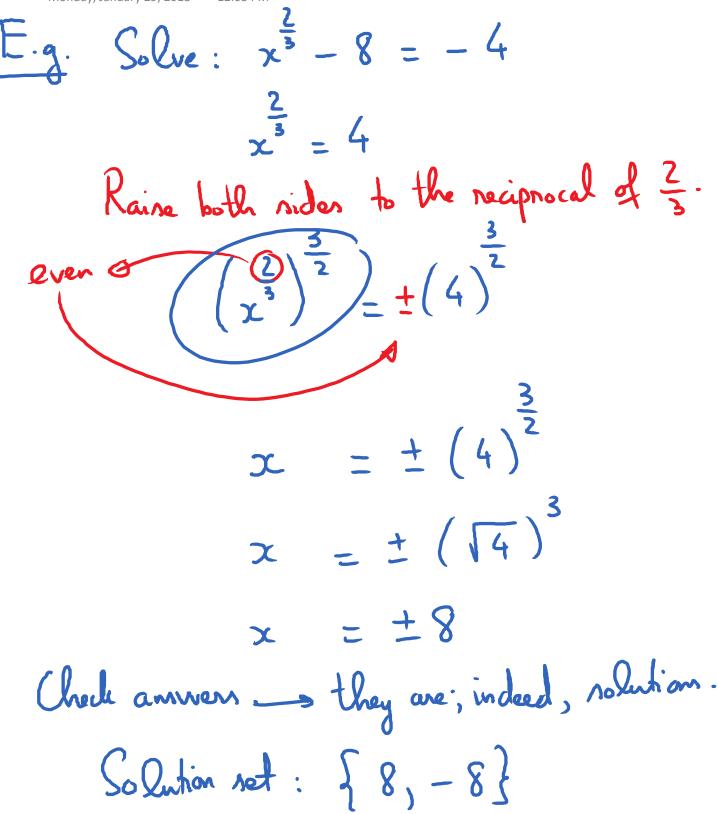
Conclusion: Solution set : {6} Obj 3: Solve equations with rational exponents Quich Review of Rational Exponents $\begin{pmatrix} 4 \end{pmatrix}^{\frac{1}{2}} = \sqrt{4} = 2 \\ \begin{pmatrix} 8 \end{pmatrix}^{\frac{1}{3}} = \sqrt{8} = 2 \\ \begin{pmatrix} 8 \end{pmatrix}^{\frac{1}{3}} = \sqrt{8} = 2 \\ \begin{pmatrix} 1 & 0 & 0 \\ 0 & 0 \end{pmatrix}^{\frac{1}{2}} = \sqrt{100} = 10$ $\frac{1}{2} = \sqrt{a}; \quad a = \sqrt{a};$ $\frac{4}{4} = \frac{4}{10}$; $\frac{1}{n} = \frac{n}{10}$ $(16)^{\frac{1}{4}} = \sqrt[4]{16} = 2$ $\left(\left(4\right)^{\frac{1}{2}} \right)^{3} = \left(\sqrt{4} \right)^{3} = \left(2\right)^{3} = 8$ $\left(4\right)^{\frac{3}{2}}$ $\sqrt{(4)^3} = \sqrt{64} = 8$

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