Solve

$x - 6x^{\frac{1}{2}} + 8 = 0$

let $u = (x^{\frac{1}{2}})^2 =$

$u^2 = x^1$

$u^2 - 6u + 8 = 0$

$(u-4)(u-2) = 0$

$u = 4 \quad u = 2$

$u = 4 \quad u = 2$

$x^{\frac{1}{2}} = 4 \quad x^{\frac{1}{2}} = 2$

$\sqrt{x}^2 = \pm 4^2 \quad \sqrt{x}^2 = \pm 2^2$

$x = 16 \quad x = 4$

13.5 Day 1

Polynomials solve

$x^2 - 2x - 8 = 0$

$(x-4)(x+2) = 0$

$x-4=0$ or $x+2=0$

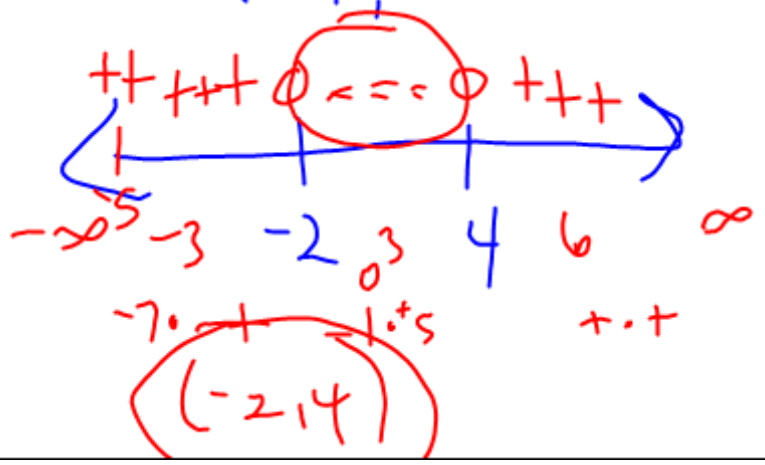
$x = 4$ $\quad x = -2$ zeros

$x^2 - 2x - 8 < 0$

$(x-4)(x+2) < 0$ DNE

① find zeros

$x = 4 \quad x = -2$



29. $x^3 + 2x^2 - x - 2 \geq 0$

$x^2(x+2) - 1(x+2) \geq 0$

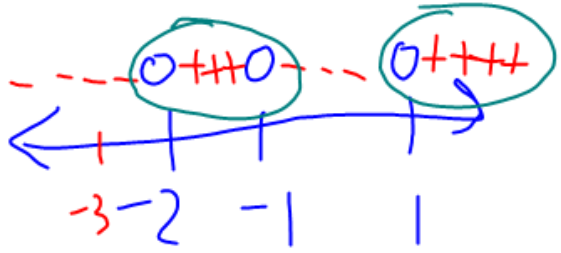
$(x+2)(x^2-1) \geq 0$

$(x+2)(x+1)(x-1) \geq 0$

Zeros $x = -2, -1, 1$

Interval	test #	
$(-\infty, -2)$	-3	$-\cdot-\cdot-=-$
$(-2, -1)$	-1.5	$+\cdot-\cdot-=+$
$(-1, 1)$	0	$+\cdot+\cdot-=-$
$(1, \infty)$	3	$+\cdot+\cdot+=+$

1. make sure 0 is on one side
2. Factor — must find Zeros

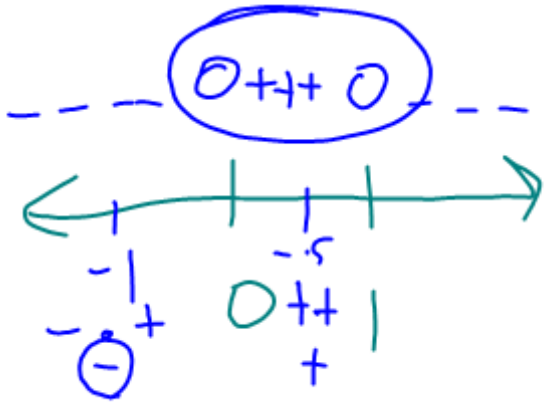


$[-2, -1] \cup [1, \infty)$

21. $-x^2 + x \geq 0$ + & zeros

$(x)(-x+1) \geq 0$

Zeros : $x = 0$ $x = 1$



Intervals	test #	
$(-\infty, 0)$	-1	$- \cdot + = -$
$(0, 1)$	0.5	$+ \cdot + = +$
$(1, \infty)$	2	$+ \cdot - = -$

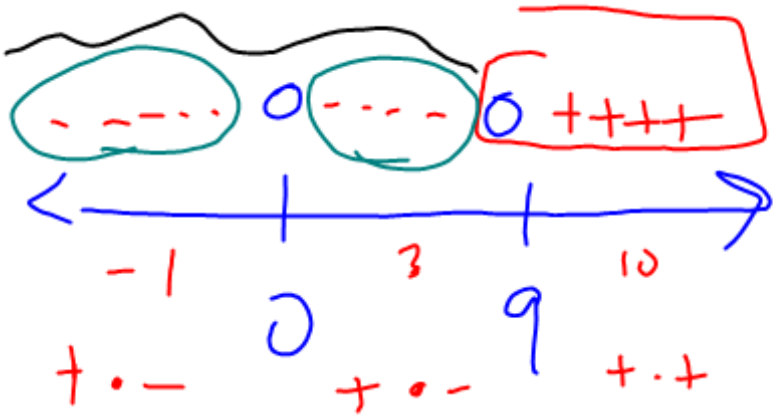
$[0, 1]$

35. $x^3 \geq 9x^2$

$x^3 - 9x^2 \geq 0$

$[9, \infty)$

$(x^2)(x-9) \geq 0$



zero's $x = 0$ & $x = 9$

$x^3 - 9x^2 < 0$

$(-\infty, -1) \cup (0, 9)$

$x^3 - 9x^2 \leq 0$

$(-\infty, 9]$

24. $x^2 \leq 2x + 2$

$x^2 - 2x - 2 \leq 0$

$[1-\sqrt{3}, 1+\sqrt{3}]$

4 + 4 -2
9 - 6 -2

Zeros

$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(-2)}}{2(1)}$$

$$x = \frac{2 \pm \sqrt{4+8}}{2} = \frac{2 \pm \sqrt{12}}{2} \quad (4, 3)$$

$$x = \frac{2 \pm 2\sqrt{3}}{2} = \frac{2(1 \pm \sqrt{3})}{2}$$

$x = 1+\sqrt{3} \approx 2.7$

$x = 1-\sqrt{3} \approx -0.7$