

Pp. 291-292

#16 tonight must be on graph paper
Thurs Quiz no calculator

$$12) x^2 - 5x + 3 + \frac{9}{x-2}$$

$$16) 4x^3 - 12x^2 + 36x - 110 + \frac{335}{x+3}$$

$$19) x^3 + x^2 + x + 1$$

32) -4 is a root, 2 is not

34) 2 is a root, -1 is not

Oct 3-10:13 AM

Pp. 291-292

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32) -4 is a root, 2 is not

34) 2 is a root, -1 is not

$$16) (4x^4 - 12x^2 + 36x - 110) \div (x+3)$$

$$\begin{array}{r} -3 \overline{) 4 \ 0 \ 0 \ -2 \ 5} \\ \underline{-12 \ 36 \ -108 \ 330} \\ 4 \ -12 \ 36 \ -110 \ 335 \end{array}$$

$$4x^3 - 12x^2 + 36x - 110 + \frac{335}{x+3}$$

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Zeros of Polynomial Functions

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Rational Root Theorem

Polynomial Function: $P(x) = a_0x^n + a_1x^{n-1} + a_2x^{n-2} + \dots + a_{n-1}x + a_n$

Polynomial Equation: $a_0x^n + a_1x^{n-1} + a_2x^{n-2} + \dots + a_{n-1}x + a_n = 0$



All the rational roots of a polynomial can be represented by $\frac{p}{q}$

Where p is a factor of a_n

And q is a factor of a_0

Find the possible rational roots:

$$3x^3 + 2x^2 - x - 12 = 0$$

$$p = -12: \pm 1, \pm 2, \pm 3, \pm 4, \pm 6, \pm 12$$

$$q = 3: \pm 1, \pm 3$$

$$\frac{p}{q} = \pm 1, \pm 2, \pm 3, \pm 4, \pm 6, \pm 12, \pm \frac{1}{3}, \pm \frac{2}{3}, \pm \frac{4}{3}$$

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Find all the zeroes (roots) and write as a product of linear factors: $(x-2)^2$

1. $x^3 - 4x^2 - 7x + 10 = 0$

① $p = 10 : \pm 1, \pm 2, \pm 5, \pm 10$

$q = 1 : \pm 1$

$\frac{p}{q} = \pm 1, \pm 2, \pm 5, \pm 10$

② Calc $y_i = -2, 1, 5$

(3)
$$\begin{array}{r|rrrr} 1 & 1 & -4 & -7 & 10 \\ & \downarrow & & & \\ & 1 & -3 & -10 & 0 \checkmark \\ 5 & 1 & -3 & -10 & 0 \checkmark \\ & \downarrow & & & \\ & 5 & 10 & & \\ -2 & 1 & 2 & 0 \checkmark \\ & \downarrow & & & \\ & 1 & 0 & & \end{array}$$

$x+2=0$
 $x=-2$

(5) $p(x) = (x-1)(x-5)(x+2)$

(4) $\{1, 5, -2\}$

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2. $x^3 + 6x^2 - 13x - 6 = 0$

① $p = -6 : \pm 1, \pm 2, \pm 3, \pm 6$

$q = 1 : \pm 1$

$\frac{p}{q} = \pm 1, \pm 2, \pm 3, \pm 6$

② Calc $y_i = -2$

$$\begin{array}{r|rrrr} 2 & 1 & 6 & -13 & -6 \\ & \downarrow & & & \\ & 1 & 2 & 16 & 6 \\ & 1 & 8 & 3 & 0 \checkmark \end{array}$$

$\left(\frac{b}{2}\right)^2$

(3) $x^2 + 8x + 3 = 0$

$x^2 + 8x + 16 = -3 + 16$

$\sqrt{(x+4)^2} = \pm\sqrt{13}$

$x+4 = \pm\sqrt{13}$

$x = -4 \pm \sqrt{13}$

(5) $p(x) = (x-2)(x - (-4+\sqrt{13}))(x - (-4-\sqrt{13}))$

$p(x) = (x-2)(x+4-\sqrt{13})(x+4+\sqrt{13})$

(4) $\{2, -4 \pm \sqrt{13}\}$

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3. $x^4 - 7x^3 + 13x^2 + 3x - 18 = 0$

① $p = -18 : \pm 1, \pm 2, \pm 3, \pm 6, \pm 9, \pm 18$

$q = 1 : \pm 1$

$\frac{p}{q} = \pm 1, \pm 2, \pm 3, \pm 6, \pm 9, \pm 18$

② calc $y_1 = \rightarrow -1, 2, 3$

$\{-1, 2, 3, 3\}$

$P(x) = (x+1)(x-2)(x-3)^2$

$$\begin{array}{r|rrrrr} 3 & 1 & -7 & 13 & 3 & -18 \\ & \downarrow & 3 & -12 & 3 & 18 \\ \hline & 1 & -4 & 1 & 6 & 0 \\ 2 & \downarrow & 2 & -4 & -6 & \\ \hline & 1 & -2 & -3 & 0 & \\ -1 & \downarrow & -1 & 3 & & \\ \hline & 1 & -3 & 0 & & \end{array}$$

$x - 3 = 0$
 $x = 3$

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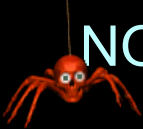
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pg 302: 51, 52, 44, 56, 58

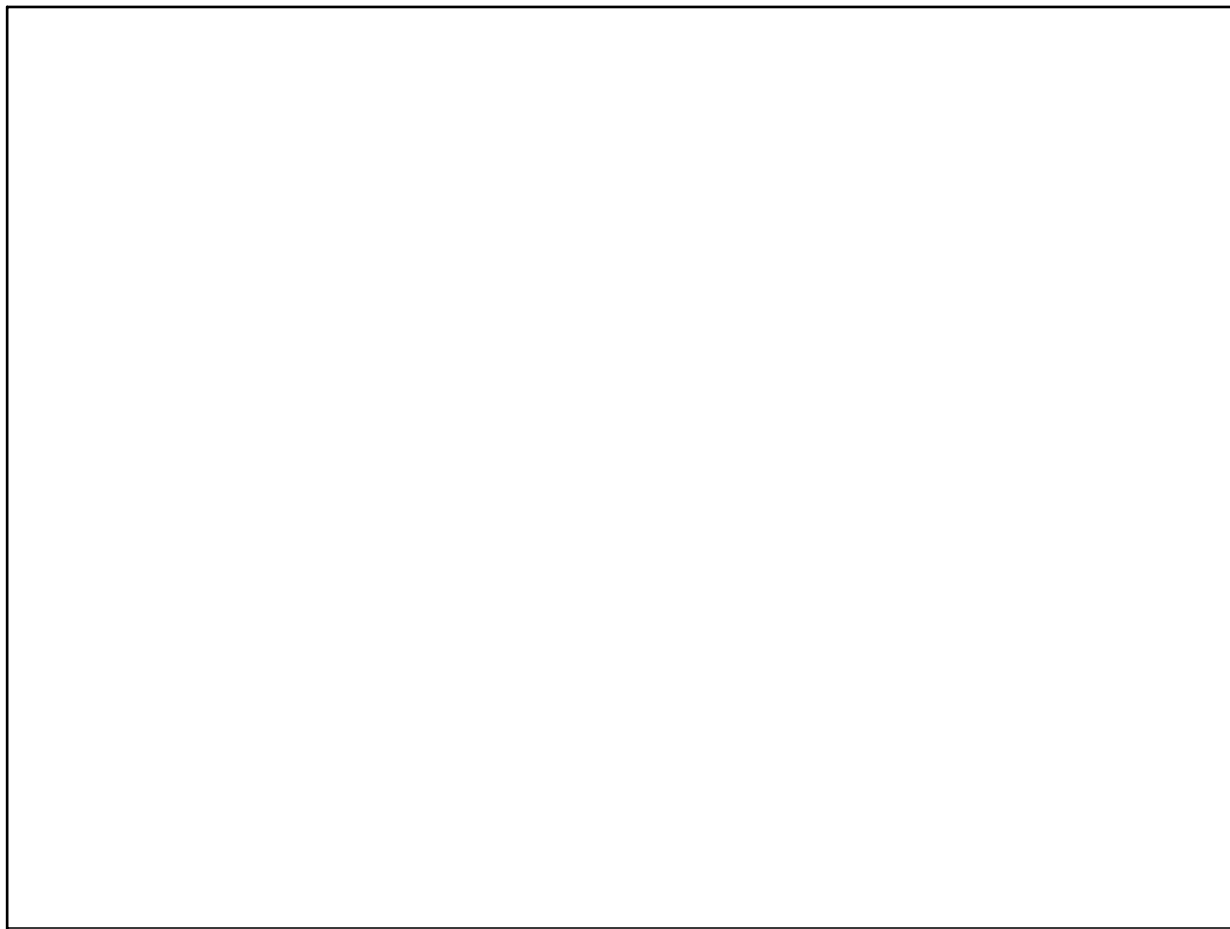
QUIZ THURSDAY

NO CALCULATOR!





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