

AND leave homework out on desk for me to check.

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4) a) 10 b) 10 c) 9

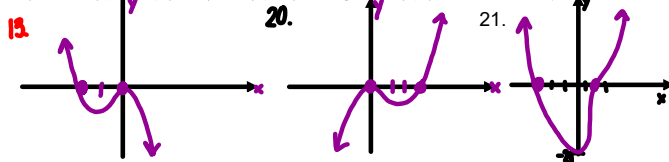
6) a) 4 b) 4 c) 3

7) d 8) a 9) f 10) c 11) b 12) e

13) x-int: (0,0) (-2,0) y-int: (0,0) tangent at (0,0) end behavior: $y = -x^3$
 20) x-int: (0,0) (3,0) y-int: (0,0) tangent at (0,0) end behavior: $y = x^3$
 21) x-int: (2,0) (-3,0) y-int: (0,-24) tangent at (2,0) end behavior: $y = -x^3$

20.

21.



13) $f(x) = -x^3 + 2x^2$

$$\wedge - x^{\text{odd}}$$

R m T/C

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11) d

13) b

34) 3, multiplicity of 1 -3, multiplicity of 1
1, multiplicity of 1 -1, multiplicity of 1

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2) a) 6

b) 6

c) 5

(4) a) 10 b) 10 c) 9

6) a) 4

b) 4

c) 3

7) d

8) a

9) f

10) c

11) b

12) e

13) x-int: (0,0) (-2,0)

y-int: (0,0)

tangent at (0,0) end behavior: $y = -x^3$

20) x-int: (0,0) (3,0)

y-int: (0,0)

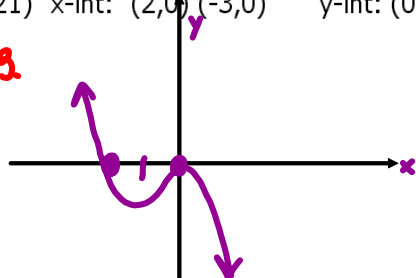
tangent at (0,0) end behavior: $y = x^3$

21) x-int: (2,0) (-3,0)

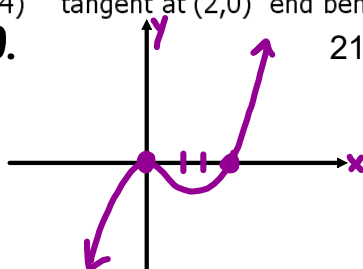
y-int: (0,-24)

tangent at (2,0) end behavior: $y = x^3$

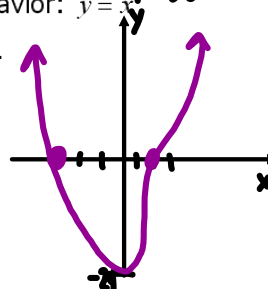
13.



20.



21.



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Synthetic Division

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$$(x^4 + 4x^3 + 6x^2 + 4x + 1) \div (x + 1)$$

$$(3x^2 + 4x - 12) \div (x - 5)$$

Long Division:

$$\begin{array}{r} 3x + 19 + \frac{83}{x-5} \\ x-5 \overline{) 3x^2 + 4x - 12} \\ \underline{-(3x^2 - 15x)} \\ 19x - 12 \\ \underline{-(19x - 95)} \\ 83 = R \end{array}$$

Synthetic Division:

root (r _i)	a ₀	a ₁	a ₂	Coeffs.
	↓ (a ₀ r _i)	(Sum r _i)		Products
	a ₀ Sum ₁	Sum ₂ =	Sum ₃	Remainder

$$\begin{array}{r|rrrr} 5 & 3 & 4 & -12 & \\ & \downarrow & 15 & 95 & \\ & 3 & 19 & 83 & = \text{Remainder} \\ \hline & x^1 & x^0 & & \\ & 3x + 19 + \frac{83}{x-5} & & & \end{array}$$

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Leave space for **all coefficients**

1. $(x^3 + 2x^2 - 5x - 6) \div (x - 2)$

$$\begin{array}{r|rrrr} 2 & 1 & 2 & -5 & -6 \\ & \downarrow & 2 & 8 & 6 & \text{Prod's} \\ \hline & 1 & 4 & 3 & 0 = \text{remainder} \\ & x^2 & x^1 & x^0 & \\ \hline & x^2 + 4x + 3 & & & \end{array}$$

2. $(x^4 - 3x^2 + 6) \div (x + 1)$

$$\begin{array}{r|rrrrrr} -1 & 1 & 0 & -3 & 0 & 6 & \text{Coeff's} \\ & \downarrow & -1 & 1 & 2 & -2 & \text{Prod's} \\ \hline & 1 & -1 & -2 & 2 & 4 = \text{remainder} \\ & x^3 & x^2 & x^1 & x^0 & \\ \hline & x^3 - x^2 - 2x + 2 + \frac{4}{x+1} & & & & \end{array}$$

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3. $(-y^6 + 4y^4 + 3y^2 + 2y) \div (y + 2)$

$$\begin{array}{r|rrrrrrr} -2 & -1 & 0 & 4 & 0 & 3 & 2 & 0 \\ & \downarrow & 2 & -4 & 0 & 0 & -6 & 8 \\ \hline & -1 & 2 & 0 & 0 & 3 & -4 & 8 \end{array}$$

$$\boxed{-y^5 + 2y^4 + 3y - 4 + \frac{8}{y+2}}$$

4. $(x^2 + 1) \div (x + 1)$

$$\begin{array}{r|rr} -1 & 1 & 0 & 1 \\ & \downarrow & -1 & 1 \\ \hline & 1 & -1 & 2 \end{array}$$

$$\boxed{x - 1 + \frac{2}{x+1}}$$

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Using synthetic division, determine whether the numbers are zeros of the polynomial function.

5. -3, 1 $f(x) = x^4 + 4x^3 + 2x^2 - 4x - 3 = 0$

$$\begin{array}{r|rrrrr} -3 & 1 & 4 & 2 & -4 & -3 \\ & \downarrow & -3 & -3 & 3 & 3 \\ \hline & 1 & 1 & -1 & -1 & 0 \end{array}$$

yes, -3 is a zero.

$$\begin{array}{r|rrrrr} 1 & 1 & 4 & 2 & -4 & -3 \\ & \downarrow & 1 & 5 & 7 & 3 \\ \hline & 1 & 5 & 7 & 3 & 0 \end{array}$$

yes, 1 is a zero

$$\cancel{\begin{array}{r|rr} 2 & 1 & 3 \end{array}}$$

If you're given $\div (x-2)$

$$\begin{array}{r|} 2 \\ \hline \end{array}$$

If you're given is 2 a possible zero?

$$\begin{array}{r|} 2 \\ \hline \end{array}$$

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Homework:

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12, 16, 19, 32, 34

Quiz THURSDAY No Calc

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