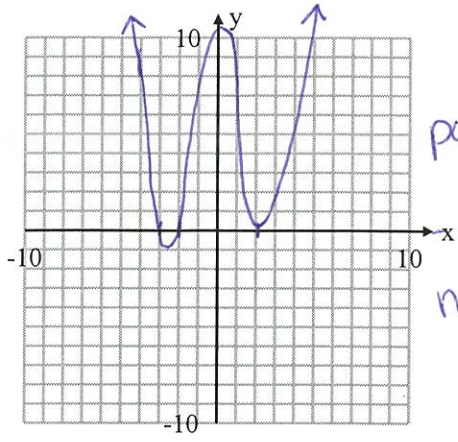
Key

Pre-Calculus 30
Graphing Polynomial Functions

$f(x) = x^4 + x^3 - 10x^2 - 4x + 24$



Degree; 4 Leading Coefficient; 1

Maximum Points: rel. max: (-0.2, 24.4)

Minimum Points: abs. min: (-2.6, -5.1)
rel. min: (2, 0, 0)

End Behaviour; II to I

Zeros/ x-intercepts; $x = -3, -2, 2$

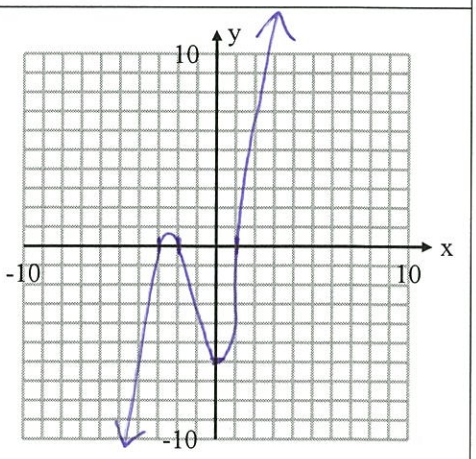
Factors; $(x+3)(x+2)(x-2)^2$

y-intercept; (0, 24)

Intervals, where positive and negative

Domain	$(-\infty, -3)$	$(-3, -2)$	$(-2, 2)$	$(2, \infty)$	
f(x)	pos.	neg.	pos.	pos.	

$f(x) = (x-1)(x+2)(x+3)$



Degree; 3 Leading Coefficient; 1

Maximum points: rel. max: (-2.5, 0.9)

Minimum Points: rel. min: (-0.1, -6.1)

End Behaviour; III to I

Zeros/ x-intercepts; $x = -3, -2, 1$

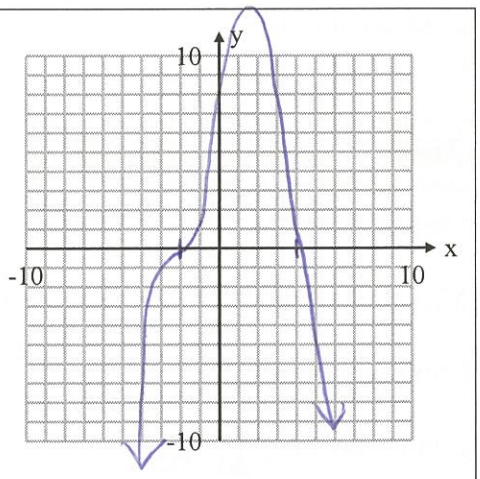
Factors; $(x-1)(x+2)(x+3)$

y-intercept; (0, -6)

Intervals, where positive and negative

Domain	$(-\infty, -3)$	$(-3, -2)$	$(-2, 1)$	$(1, \infty)$	
f(x)	neg.	pos.	neg.	pos.	

$f(x) = -(x+2)^3(x-4)$



Degree; 4 Leading Coefficient; -1

Maximum points: abs. max: (2.5, 136.7)

Minimum Points: none

End Behaviour; III to IV

Zeros/ x-intercepts; $x = -2, 4$

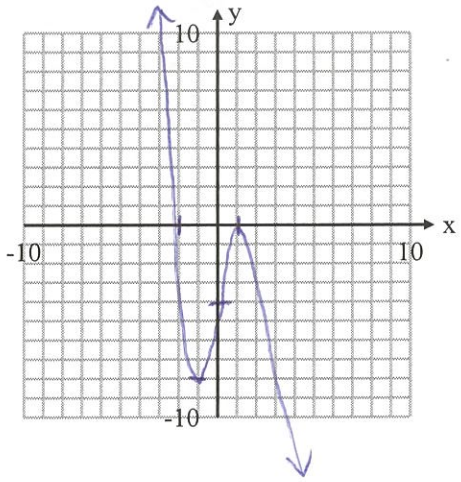
Factors; $(x+2)^3(x-4)$

y-intercept; (0, 32)

Intervals, where positive and negative

Domain	$(-\infty, -2)$	$(-2, 4)$	$(4, \infty)$		
f(x)	neg.	pos.	neg.		

$f(x) = -2x^3 + 6x - 4$



Degree; 3 Leading Coefficient; -2

Maximum points: rel. max: (1, 0)

Minimum Points: rel. min: $(-1, -8)$

End Behaviour; II to IV

Zeros/ x-intercepts; $x = -2, 1$

Factors; $(x+2)(x-1)^2$

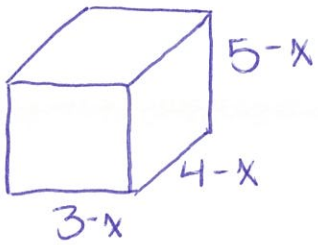
y-intercept; $(0, -4)$

Intervals, where positive and negative

Domain	$(-\infty, -2)$	$(-2, 1)$	$(1, \infty)$		
f(x)	pos.	neg.	neg.		

Word Problem

1. Henry is preparing to make an ice-sculpture. He has a block of ice that is 3m by 4 m by 5 m. He needs to reduce the size of the block by removing the same amount from each side and having a volume of 24 m^2.



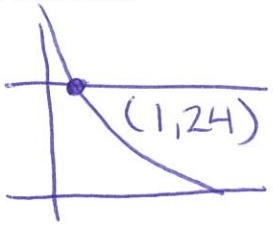
a. Write a polynomial to represent this function

$24 = (3-x)(4-x)(5-x)$

b. Determine how much he needs to remove from each side

$y_1 = 24$

$y_2 = (3-x)(4-x)(5-x)$



$x = 1$m off each side

Dimensions: $3-1=2$, $4-1=3$, $5-1=4$

2m × 3m × 4m

2. Three consecutive integers have a product of -210, what are the three integers.

1st: x

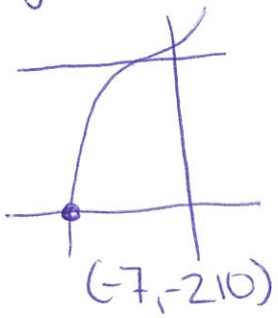
2nd: $x+1$

3rd: $x+2$

$x(x+1)(x+2) = -210$

$y_1 = x(x+1)(x+2)$

$y_2 = -210$



$x = -7$

$x+1 = -6$

$x+2 = -5$

-7, -6, -5

Pg. 147 #2, 4, 5, 7ac, 10acd.