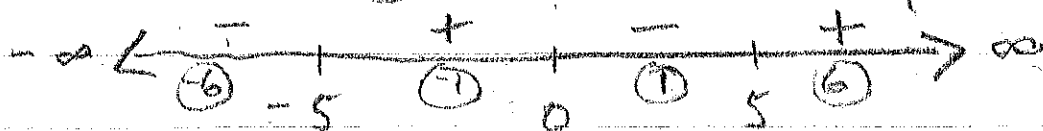


3.4 - 3.6 WS

$$4.) \frac{(x-5)(x+5)}{x} \leq 0$$

① Find all zeros & where it's undefined
 $x = \pm 5$, $x = 0$ (undefined)

② Plot the points found in step 1 on a number line and then choose test values in the intervals to sub into the expression on the \leq side of the inequality



③ Since the inequality is \leq , our solution is only going to be intervals that have a (-) sign above them.

• Solution : $(-\infty, -5] \text{ or } (0, 5]$

$$5.) \frac{x+20}{x} < 9 \rightarrow \frac{x+20}{x} - 9 < 0$$

• common denom. of $x \rightarrow \frac{x \cdot x + 20 - 9 \cdot x}{x} < 0$

$$\frac{x^2 + 20 - 9x}{x} < 0 \rightarrow \frac{x^2 - 9x + 20}{x} < 0$$

$$\frac{(x-4)(x-5)}{x} < 0 \quad \text{zeros @ } x=4, 5$$

and @ $x=0$

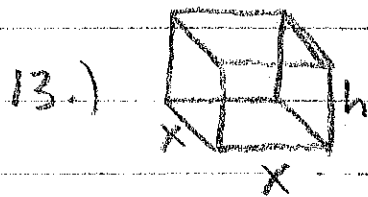
<over>

3.4 - 3.6 WS (continued)

9.) y-intercept of $f(x) = \frac{(x-2)^2}{(x+11)^3}$

• To find the y-int, sub zero in for x and solve.

$$f(0) = \frac{(0-2)^2}{(0+11)^3} \Rightarrow \boxed{\left(0, \frac{4}{1331}\right)}$$



$$\text{Volume} = x^2 \cdot h$$

$$SA = 2x^2 + 4xh$$

$$\frac{8000}{x^2} = \frac{x^2 \cdot h}{x^2}$$

$$SA = 2x^2 + 4x \left(\frac{8000}{x^2} \right)$$

① sub given volume into volume

$$\frac{8000}{x^2} = h$$

$$SA = 2x^2 + \frac{32000}{x}$$

Formula + solve for h.

② Sub $\frac{8000}{x^2}$ in

16.) Find real zeros, then use real zeros to factor f over the real #'s.

$$f(x) = x^4 - 15x^2 - 16 \rightarrow 0 = (x^2 - 16)(x^2 + 1)$$

$$\text{real zeros} \rightarrow x^2 - 16 = 0 \rightarrow \boxed{x = \pm 4}$$

for h in the surface area formula and simplify

Factored f over real zeros

$$\boxed{f(x) = (x+4)(x-4)(x^2+1)}$$

17.) (same directions as #16)

$$f(x) = 3x^4 - 24x^3 + 49x^2 - 8x + 16$$

- graph on calc & use 2nd trace \rightarrow zero to find real zeros.
- real zero @ $x=4$ w/ mult 2 b/c it touches the x-axis at $x=4$
- use a 4 + synthetic division w/ $f(x)$

$$\begin{array}{r|rrrrr} 4 & 3 & -24 & 49 & -8 & 16 \\ & & 12 & -48 & 4 & -16 \\ \hline & 3 & -12 & 1 & -4 & 0 \end{array}$$

$$\boxed{3x^3 - 12x^2 + x - 4}$$

$$3x^2(x-4) + 1(x-4) \rightarrow (3x^2+1)(x-4)$$

- so in factored form, make sure you include the 4 that you used w/ synthetic division

$$\boxed{f(x) = (x-4)^2(3x^2+1)}$$