

Unit 6 ICM Quiz Review

Determine the following for the given function (#1-20).

$$f(x) = \frac{x^3 + 64}{x^2 - 16} = \frac{(x+4)(x^2 - 4x + 16)}{(x+4)(x-4)} = \frac{x^2 - 4x + 16}{x-4}$$

1) Domain: $(-\infty, -4) \cup (-4, 4) \cup (4, \infty)$

10) vertical asymptotes: $x = 4$

2) Range: $(-\infty, -4] \cup [12, \infty)$

11) horizontal asymptotes none

3) removable point of (hole) discontinuity: $(-4, -6)$

12) Continuous? no!

13) Non-removable discontinuity? $x = 4$

4) Increasing $(-\infty, -4) \cup (-4, 0] \cup [8, \infty)$

14) $\lim_{x \rightarrow \infty} f(x) = \infty$

5) Decreasing $[0, 4) \cup (4, 8]$

15) $\lim_{x \rightarrow -\infty} f(x) = -\infty$

6) Local Min 12 occurs at $x = 8$

16) $\lim_{x \rightarrow 4^-} f(x) = -\infty$

7) Local Max -4 occurs at $x = 0$

17) $\lim_{x \rightarrow 4^+} f(x) = \infty$

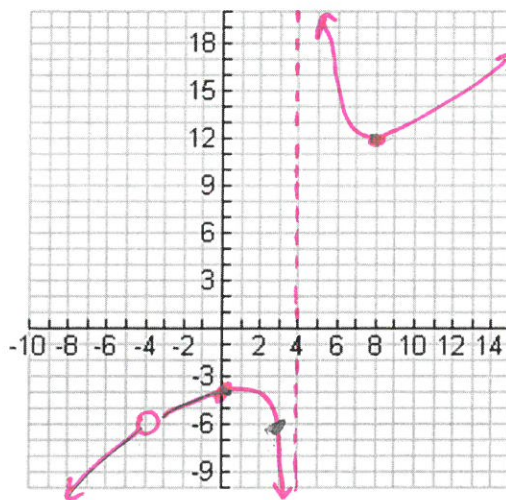
8) x-intercept(s): none

18) $\lim_{x \rightarrow 4} f(x) = DNE$

9) y-intercept(s): $(0, -4)$

19) $\lim_{x \rightarrow -4} f(x) = -6$

20) Sketch:



21) Given: $\sqrt{2x^2 + 11x + 14}$ $x = -3.5, -2$

Find Domain (no decimals):

$(-\infty, -3.5] \cup [-2, \infty)$

Find Range:

$[0, \infty)$

22) Given: $\frac{\sqrt{x+2}}{x-3}$

Find Domain: $[-2, 3) \cup (3, \infty)$

Find Range: $(-\infty, \infty)$