

Answers

Precalculus Review Problems for MAC 2311

1. Factor and solve:

$$x^{-2/3}(2-x)^2 - 6x^{1/3}(2-x) = 0 \quad x^{-2/3}(2-x)(2-7x) = 0 \quad x = 2, \frac{2}{7}$$

2. Solve for x : $x = \sqrt{5-x^2} - 1 \quad x = 1$

3. a) Simplify: $\frac{2x(1-x^2)^{1/3} + \frac{2}{3}x^3(1-x^2)^{-2/3}}{(1-x^2)^{2/3}} \quad (1-x^2)^{-4/3}(2x)(1-\frac{2}{3}x^2)$

b) Solve for x : $\frac{2x(1-x^2)^{1/3} + \frac{2}{3}x^3(1-x^2)^{-2/3}}{(1-x^2)^{2/3}} = 0 \quad x = 0, \pm \frac{\sqrt{6}}{2}$

4. Find the solution set: $\frac{10-x}{x+2} \geq 2 \quad (-2, 2]$

5. Solve for x : a) $\frac{2}{5-3x} - \frac{1}{x^2} = 0 \quad x = -\frac{5}{2}, 1$

b) $2x^{1/3} - 16x^{-2/3} = 0 \quad x = 8$

6. a) Write in simplest form: $\frac{(x^2-1)^{1/2} - (x^2-1)^{-1/2}(2-x^2)}{x^2-1} \quad (x^2-1)^{-3/2}(2x^2-3)$

b) Solve for x : $\frac{(x^2-1)^{1/2} - (x^2-1)^{-1/2}(2-x^2)}{x^2-1} = 0 \quad x = \pm \frac{\sqrt{6}}{2}$

7. Solve for y and write your answer in interval notation:

a) $\frac{y-5}{y+4} \geq 0$ b) $\left|4 - \frac{x}{2}\right| \leq 3$

$(-\infty, -4) \cup [5, \infty)$ $[2, 14]$

8. If $f(x) = \frac{3x}{2x+3}$, find and simplify the difference quotient $\frac{f(x+h) - f(x)}{h}$.

$$\frac{9x}{h(2x+2h+3)(2x+3)}$$