

Name Answer key

Date _____

Ms. Schmidt

Pre-Calculus

Test 6 Review Answer Sheet

<p>1a)</p> $\frac{3}{3x-2}$ $3x-2=0$ $3x=2$ $x=2/3$	<p>1b)</p> $\frac{x^2+2x}{x^2-4}$ $x^2-4=0$ $\sqrt{x^2}=4$ $x=\pm 2$
<p>1c)</p> $\frac{x+3}{x^3-16x}$ $x^3-16x=0$ $x(x^2-16)=0$ $x(x-4)(x+4)=0$ $x=0 \quad x=4 \quad x=-4$	<p>1d)</p> $\frac{x^2+2x+1}{x^2-x-6}$ $x^2-x-6=0$ $(x-3)(x+2)=0$ $x=3 \quad x=-2$
<p>2a)</p> $\frac{x^2-13x+40}{x-8} \div \frac{45x-9x^2}{9x^2-54x}$ $\frac{x^2-13x+40}{x-8} \cdot \frac{9x^2-54x}{45x-9x^2}$ $\frac{\cancel{(x-5)}\cancel{(x-8)}}{\cancel{(x-8)}} \cdot \frac{9x(x-6)}{-9x\cancel{(x-5)}} = \frac{-1(x-6)}{-x+6}$ <p style="text-align: center;">or -x+6</p>	<p>2b)</p> $\frac{x^2-16}{-2x^3-10x^2-8x} \div \frac{3x^2-11x-4}{18x^3+6x^2}$ $\frac{x^2-16}{-2x^3-10x^2-8x} \cdot \frac{18x^3+6x^2}{3x^2-11x-4}$ $\frac{\cancel{(x-4)}\cancel{(x+4)}}{\cancel{2}x\cancel{(x+4)}(x+1)} \cdot \frac{\cancel{3}x^2(3x+1)}{\cancel{(3x+1)}\cancel{(x-4)}}$ <p style="text-align: center;">$\frac{3}{-(x+1)}$</p>

3a)

$$\frac{4}{3+i} \frac{(3-i)}{(3-i)} = \frac{12-4i}{9-3i+3i-x^2} \quad (-1)$$

$$\frac{12-4i}{9+1} = \frac{12-4i}{10}$$

$$\frac{6}{5} - \frac{2}{5}i$$

3b)

$$\frac{10}{3-5i} \frac{(3+5i)}{(3+5i)}$$

$$\frac{30+50i}{9-15i+15i-25i^2} \quad (-1)$$

$$\frac{30+50i}{9+25} = \frac{30+50i}{34}$$

$$\frac{15}{17} + \frac{25}{17}i$$

4a)

$$f(x) = -(3x+4)^2 - 5$$

Left 4

Reflection x-axis

Stretch 3

down 5

4b)

$$f(x) = \left(-\frac{1}{2}x - 1\right)^2 + 3$$

right 1

Reflection y-axis

Shrink 1/2

up 3

5a)

$$\frac{2x^2+5x}{9-x^2} - \frac{x^2+2x+18}{9-x^2}$$

$$\frac{2x^2+5x-x^2-2x-18}{9-x^2}$$

$$\frac{x^2+3x-18}{9-x^2}$$

$$\frac{(x+6)(x-3)^{(-1)}}{(x+6)(x-3)}$$

$$\frac{\cancel{(3-x)}(3+x)}{\cancel{(3-x)}(3+x)}$$

$$\frac{-1(x+6)}{(3+x)}$$

5b)

$$\frac{1}{x+1} + \frac{x}{x-6} - \frac{5x-2}{x^2-5x-6}$$

$$\frac{1(x-6)}{(x+6)} + \frac{x(x+1)}{(x+1)} - \frac{5x-2}{(x-6)(x+1)}$$

$$\frac{x-6}{(x+1)(x-6)} + \frac{x^2+x}{(x+1)(x-6)} - \frac{5x-2}{(x+1)(x-6)}$$

$$\frac{x-6+x^2+x-5x+2}{(x+1)(x-6)}$$

$$\frac{x^2-3x-4}{(x+1)(x-6)} = \frac{(x-4)(x+1)}{\cancel{(x+1)}(x-6)}$$

$$\frac{x-4}{x-6}$$

6a)

$$f(x) = \frac{x^2+x-2}{2x^2-8} = \frac{(x+2)(x-1)}{2(x+2)(x-2)}$$

$$f(x) = \frac{x-1}{2(x-2)}$$

SA \rightarrow DNE ($\frac{x^2}{x^2}$ the same)

hole $\rightarrow x = -2$

$$\frac{-2-1}{2(-2-2)} = \frac{-3}{-8} = \frac{3}{8} \quad (-2, 3/8)$$

$$VA \rightarrow 2(x-2) = 0 \quad x = 2$$

$$2x-4=0$$

$$2x=4$$

$$x=2$$

$$HA \frac{x^2}{2x^2} \rightarrow y = \frac{1}{2}$$

6b)

$$f(x) = \frac{3x^2+5x-2}{x-1} = \frac{(3x-2)(x+1)}{(x-1)}$$

holes \rightarrow DNE (nothing cancel)

$$VA \rightarrow x-1=0 \rightarrow x=1$$

$$HA \rightarrow \frac{3x^2}{x} \rightarrow DNE$$

$$SA \rightarrow x-1 \overline{) 3x^2+5x-2}$$

$$\begin{array}{r} 3x+8 \\ -(3x^2+3x) \downarrow \\ 8x-2 \\ -(8x+8) \\ \hline 6 \end{array}$$

$$SA \rightarrow y = 3x+8$$

7a)

$$\frac{2(x+2)}{x-2} + \frac{1(x-2)}{x+2} = \frac{2x+4+x-2}{(x-2)(x+2)}$$

$$\frac{6}{x^2-4} = \frac{6}{(x-2)(x+2)}$$

$$\frac{3x+2}{(x-2)(x+2)} \cdot \frac{(x-2)(x+2)}{(x-2)(x+2)}$$

$$\frac{3x+2}{6}$$

7b)

$$\frac{1}{x^2} - 1 \left(\frac{x^2}{x^2} \right) = \frac{1-x^2}{x^2}$$

$$\left(\frac{x}{x} \right) + \frac{1}{x} = \frac{x+1}{x}$$

$$\frac{1-x^2}{x^2} \cdot \frac{x}{x+1}$$

$$\frac{(1-x)(1+x)}{x^2} \cdot \frac{x}{x+1}$$

$$\frac{1-x}{x}$$

8a)

$$\{0, 2i\}$$

$$x=0 \quad (x-2i)^2$$

$$x^2 = 4i^2$$

$$x^2 = -4$$

$$+4 \quad +4$$

$$x^2 + 4$$

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

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

8b)

$$\{-3, 1+2i\}$$

$$x = -3 \quad x = 1+2i$$

$$+3 \quad +3 \quad -1 \quad -1$$

$$x+3 \quad (x-1)^2 = (2i)^2$$

$$x^2 - 2x + 1 = 4i^2$$

$$x^2 - 2x + 1 = -4$$

$$+4 \quad +4$$

$$x^2 - 2x + 5$$

$$f(x) = (x+3)(x^2 - 2x + 5)$$

$$f(x) = x^3 - 2x^2 + 5x + 3x^2 - 6x + 15$$

$$f(x) = x^3 + x^2 - x + 15$$