

MATH 2200  
TEST (FOR REVIEW)

- |       |        |
|-------|--------|
| 1.) A | 8.) B  |
| 2.) D | 9.) C  |
| 3.) C | 10.) A |
| 4.) B |        |
| 5.) D |        |
| 6.) A |        |
| 7.) C |        |

Part 2

1.) Simplify

$$\frac{4+2\sqrt{3}}{1-\sqrt{3}} \cdot \frac{1+\sqrt{3}}{1+\sqrt{3}}$$

$$\frac{4(1) + 4\sqrt{3} + 2\sqrt{3} + 2\sqrt{3} \cdot \sqrt{3}}{1 + \sqrt{3} - \sqrt{3} - \sqrt{3} \cdot \sqrt{3}}$$

$$\frac{4 + 6\sqrt{3} + 2(3)}{1 - \sqrt{9}}$$

$$\frac{4 + 6\sqrt{3} + 6}{1 - 3}$$

$$\frac{10 + 6\sqrt{3}}{-2}$$

$$\boxed{-5 - 3\sqrt{3}}$$

2.) Simplify

$$\frac{1}{3}\sqrt{63} + \frac{3}{5}\sqrt{75} - \frac{5}{2}\sqrt{2} - 3\sqrt{27}$$

$$\frac{1}{3}\sqrt{3 \cdot 3 \cdot 7} + \frac{3}{5}\sqrt{5 \cdot 3 \cdot 3} - \frac{5}{2}\sqrt{2} - 3\sqrt{3 \cdot 3 \cdot 3}$$

$$\frac{3}{3}\sqrt{7} + \frac{3 \cdot 3}{5}\sqrt{3} - \frac{5}{2}\sqrt{2} - 3 \cdot 3\sqrt{3}$$

$$1\sqrt{7} + 3\sqrt{3} - \frac{5}{2}\sqrt{2} - 9\sqrt{3}$$

$$\boxed{1\sqrt{7} - 6\sqrt{3} - \frac{5}{2}\sqrt{2}}$$

3.) Area

$$(6\sqrt{50} - 6\sqrt{48})(3\sqrt{32} + 9\sqrt{75})$$

$$(6\sqrt{25 \cdot 2} - 6\sqrt{16 \cdot 3})(3\sqrt{16 \cdot 2} + 9\sqrt{25 \cdot 3})$$

$$(6 \cdot 5\sqrt{2} - 6 \cdot 4\sqrt{3})(3 \cdot 4\sqrt{2} + 9 \cdot 5\sqrt{3})$$

$$(30\sqrt{2} - 24\sqrt{3})(12\sqrt{2} + 45\sqrt{3})$$

$$30 \cdot 12\sqrt{2 \cdot 2} + 30 \cdot 45\sqrt{2 \cdot 3} - 24 \cdot 12\sqrt{2 \cdot 3} - 24 \cdot 45\sqrt{3 \cdot 3}$$

$$360\sqrt{4} + 1350\sqrt{6} - 288\sqrt{6} - 1080\sqrt{9}$$

$$\underline{360(2) + 1062\sqrt{6} - 1080(3)}$$

$$720 + 1062\sqrt{6} - 3240$$

$$\boxed{1062\sqrt{6} - 2520}$$

4.) Answer, Verify, restriction FYInformation

$$a) 2\sqrt{x+2} = \sqrt{2x-2}$$

$$\text{If } \frac{-2x}{-2} \geq \frac{2}{-2}$$

$$x \leq -1$$

Restriction

$$\sqrt{x+2} \geq 0 \quad \text{and}$$

$$x+2 \geq 0$$

$$\boxed{x \geq -2}$$

$$\sqrt{2x-2} \geq 0$$

$$2x-2 \geq 0$$

$$\frac{2x}{2} \geq \frac{2}{2}$$

$$\boxed{x \geq 1}$$

Solve

$$(2\sqrt{x+2})^2 = (\sqrt{2x-2})^2$$

$$4(x+2) = 2x-2$$

$$4x+8 = 2x-2$$

$$\frac{2x}{2} = \frac{-10}{2}$$

Verify

When  $x = -5$

$$2\sqrt{-5+2} = \sqrt{2(-5)-2}$$

$$2\sqrt{-3} = \sqrt{-10-2}$$

$$2\sqrt{-3} = \sqrt{-12}$$

the root ( $x = -5$ ) is extraneous

But

$$(2\sqrt{-3})^2 = (\sqrt{-12})^2$$

$$4(-3) = -12$$

$$-12 = -12$$

4b)

Restrictions

$$\sqrt{3x-5} \geq 0 \quad \text{and} \quad \sqrt{x-2} \geq 0$$

$$3x-5 \geq 0$$

$$\frac{3x}{3} \geq \frac{5}{3}$$

$$x \geq \frac{5}{3}$$

$$x-2 \geq 0$$

$$x \geq 2$$

$$4b) (\sqrt{3x-5})^2 = (3+\sqrt{x-2})^2$$

$$\begin{cases} 3x-5 = 9+3\sqrt{x-2}+3\sqrt{x-2}+(x-2) \\ 3x-5-9-6\sqrt{x-2}-x+2=0 \\ 2x-14+2-6\sqrt{x-2}=0 \\ 2x-12-6\sqrt{x-2}=0 \\ \frac{d}{2}(x-6-3\sqrt{x-2}) = \frac{0}{2} \\ (x-6)^2 = (3\sqrt{x-2})^2 \\ x^2-12x+36 = 9(x-2) \end{cases}$$

$$x^2-12x+36 = 9x-18$$

$$x^2-21x+54 = 0$$

$$(x-3)(x-18) = 0$$

$$x=3 \quad \left\{ \quad x=18$$

Verify  $x=3$  extraneous

$$\sqrt{3(3)-5} = 3\sqrt{3-2}$$

$$\sqrt{9-5} = 3\sqrt{1}$$

$$\sqrt{4} \neq 3$$

$x=18$  works

$$\sqrt{3(18)-5} = 3\sqrt{18-2}$$

$$7 = 3 \cdot \sqrt{16}$$

$$7 = 7$$

5.) Errors (find)

$$\frac{\sqrt{5} + \sqrt{11}}{\sqrt{5} - \sqrt{11}} \cdot \frac{\sqrt{5} + \sqrt{11}}{\sqrt{5} + \sqrt{11}}$$

$$\frac{\sqrt{5 \cdot 5} + \sqrt{5 \cdot 11} + \sqrt{5 \cdot 11} + \sqrt{11 \cdot 11}}{\sqrt{5 \cdot 5} - \sqrt{5 \cdot 11} + \sqrt{5 \cdot 11} - \sqrt{11 \cdot 11}}$$

$$\frac{5 + \boxed{2\sqrt{5 \cdot 11}} + 11}{5 - 11}$$

$$\frac{16 + 2\sqrt{55}}{5 - 11}$$

$$\frac{16 + 2\sqrt{55}}{-6}$$

$$\frac{-8 - 1\sqrt{55}}{3}$$

mistake  
was this  
term was  
dropped