Name: KEY Per. ____

Pre-Calculus Test Chapter 0 Form A Show ALL work!!!

1 Rationalize the denominator of the expression. Then simplify your answer.

$$\frac{2}{5-\sqrt{3}}\frac{(5+\sqrt{3})}{(5+\sqrt{3})}$$

$$=\frac{2(5+\sqrt{3})}{25-3}=\frac{\cancel{2}^{1}(5+\sqrt{3})}{\cancel{22}_{11}}$$

$$=\boxed{\frac{5+\sqrt{3}}{11}}$$

2 Simplify.

$$\sqrt[3]{8\times 10^{15}}$$

$$=\sqrt[3]{8}\times\sqrt{10^{15}}$$

$$=2\times 10^{5}$$

$$=\boxed{200{,}000}$$

3 Factor.

$15x^2-11x+2$

$+$ -11 -5 -6 $30x$

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

$$=5x(3x-1)-2(3x-1)$$

$$=\boxed{(3x-1)(5x-2)}$$

4 Simplify.

$$\frac{x^2-14x+49}{x^2-49}\div\frac{3x-21}{x+7}$$

$$\frac{x^2-14x+49}{x^2-49}\cdot\frac{x+7}{3x-21}$$

$$\frac{\cancel{(x-7)}\cancel{(x-7)}}{\cancel{(x-7)}\cancel{(x+7)}}\cdot\frac{\cancel{x+7}}{3\cancel{(x-7)}}=\boxed{\frac{1}{3}}$$

5 Rewrite the expression in radical form.

$$81^{\frac{3}{4}}=\boxed{\sqrt[4]{81^3}\text{ OR }\left(\sqrt[4]{81}\right)^3}$$

6 Factor completely.

$$16x^2-\frac{1}{9}$$

$$=4^2x^2-\left(\frac{1}{3}\right)^2$$

$$=(4x)^2-\left(\frac{1}{3}\right)^2$$

$$=\boxed{\left(4x-\frac{1}{3}\right)\left(4x+\frac{1}{3}\right)}$$

7 Solve the equation and check your solution.

$$\frac{3}{x^2-3x}+\frac{4}{x}=\frac{1}{x-3}$$

LCD: $x(x-3)$

$$x(x-3)\left(\frac{3}{x(x-3)}+\frac{4}{x}\right)=\left(\frac{1}{x-3}\right)x(x-3)$$

$$3+4(x-3)=x$$

$$3+4x-12=x$$

$$-4x \qquad -4x$$

$$\frac{-9}{-3}=\frac{-3x}{-3}$$

$$x=3$$

No! Check ✗

$\boxed{\text{No Solution}}$

8 Simplify.

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

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

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

9 Simplify the radical expression.

$$\sqrt[5]{160x^8z^4}$$

2 | 80
2 | 40
2 | 20
2 | 10
2 | 5

xxxxxxxx zzzz

$$\boxed{2x\sqrt[5]{5x^3z^4}}$$

10 Solve the equation and check your solutions.

$$(x-5)^{\frac{3}{2}}=8$$

$$\left((x-5)^{3/2}\right)^{2/3}=8^{2/3}$$

$$x-5=\left(\sqrt[3]{8}\right)^2$$

$$x-5=4$$

$$+5 \qquad +5$$

$$\boxed{x=9}$$

Check ✓

11 Simplify the radical expression.

$$10\sqrt{32}-6\sqrt{18}=10\cdot2\cdot2\sqrt{2}-6\cdot3\sqrt{2}$$

2 | 16
2 | 8
2 | 4
2 | 2

2 | 9
3 | 3

$$=40\sqrt{2}-18\sqrt{2}$$

$$=\boxed{22\sqrt{2}}$$

12 Factor completely.

$$27x^3+8$$

$$=3^3x^3+2^3$$

$$=(3x)^3+2^3$$

$$=(3x+2)\left((3x)^2-(3x)(2)+2^2\right)$$

$$=\boxed{(3x+2)(9x^2-6x+4)}$$

13 Simplify the expression.

$$\sqrt{\sqrt{32}}$$

$$=\left((32)^{1/2}\right)^{1/2}$$

$$=32^{1/4}=\sqrt[4]{32}=\boxed{2\sqrt[4]{2}}$$

32
2 | 16
2 | 8
2 | 4
2 | 2

14 Determine which number in the setare natural numbers, integers, ratonial numbers, and irrational numbers.

$$\sqrt{5},\ -7,\ -\frac{7}{3},\ 0,\ 3.12,\ \frac{5}{4},\ -3,\ 12,\ 5$$

Natural Numbers: 0, 5, 12

Integers: 0, 5, 12, -7, -3

Rational Numbers: 0, 5, 12, -7, -3, $-\frac{7}{3}$, 3.12, $\frac{5}{4}$

Irrational Numbers: $\sqrt{5}$

15 Use the quadratic formula to solve.

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

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

$a=-1 \quad b=2 \quad c=2$

12

2 6

2 3

$x=\frac{-2\pm\sqrt{2^2-4(-1)(2)}}{2(-1)}=\frac{-2\pm\sqrt{4+8}}{-2}$

$=\frac{-2\pm\sqrt{12}}{-2}=\frac{-2\pm2\sqrt{3}}{-2}=1\pm\sqrt{3}$

$\boxed{x=1\pm\sqrt{3}}$

16 Solve by completing the square.

$x^2-2x-3=0$

$+3 \quad +3$

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

$x^2-2x=3$

$x^2-2x+1=3+1$

$\sqrt{(x-1)^2}=\pm\sqrt{4}$

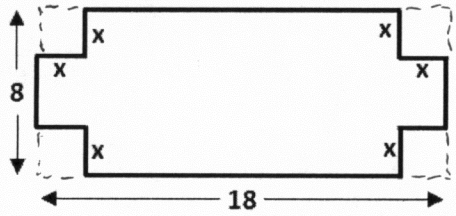
$\boxed{x=-1,\ x=3}$

$x-1=\pm2$

$+1 \quad +1$

$x=1\pm2$

17 **Geometry** Write an expression in factored form for the area of the shaded portion of the figure.



$A=A_{Big\square}-4A_{\square}$

$=(8)(18)-4x^2$

$=144-4x^2$

$=4(36-x^2)$

$\boxed{A=4(6-x)(6+x)}$

18 Solve. **Note:** Don't forget to check for extraneous solutions.

$\sqrt{2x+7}-x=2$

$+x \quad +x$

$(2+x)(2+x)$

$(\sqrt{2x+7})^2=(2+x)^2$

$2x+7=4+4x+x^2$

$-2x \quad -7 \quad -7 \quad -2x$

x^2+2x-3

$(x+3)(x-1)=0$

$x+3=0 \quad x-1=0$

$x=-3 \quad x=1$

No Yes Check

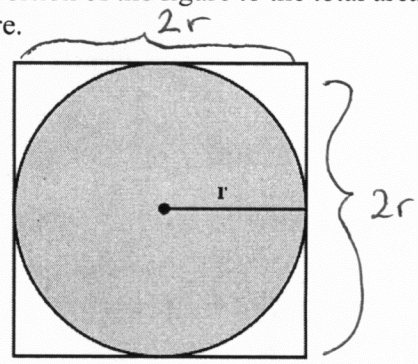
$\boxed{x=1}$

19 Find the greatest common factor such that the remaining factors have only integer coeeficients.

$\frac{1}{3}y^2-5y+2$

$\boxed{\frac{1}{3}(y^2-15y+6)}$

20 **Geometry** Find the ratio of the area of the shaded portion of the figure to the total area of the figure.



$\frac{A_o}{A_{\square}}=\frac{\pi r^2}{4r^2}=\boxed{\frac{\pi}{4}}$