

Station 1: Radical Expressions

Simplify:

1. $(2 + \sqrt{5})(1 - \sqrt{5})$

2. $\sqrt[3]{108} - 2\sqrt{75} + \sqrt{147}$

3. $\frac{1}{2 - \sqrt{3}}$

4. $\frac{\sqrt{60a^8}}{\sqrt{72a^5}}$

Write the rational exponents in radical form:

5. $4^{\frac{2}{3}}$

Station 2: Complex Numbers

1. $\sqrt{-3} \cdot 5i$

2. $(8 - 5i) - (-1 + 3i)$

3. $(2 - i\sqrt{3})(2 + i\sqrt{3})$

4. $\frac{(7+2i)}{4+5i}$

Station 3: Logarithms

- 1. Evaluate each expression.** **2. Expand each logarithm.**

$$\log_7 343$$

$$\log_8 (a^6 b^5)$$

- 3. Condense each expression to a single logarithm.**

$$2\log_4 x + 6\log_4 y$$

Solve each equation.

4. $\log_8 x = 4$

5. $e^{2x} = 54.$

Station 4: Rationals

1. $\frac{p^2 - 5p - 24}{8p - 64} \cdot \frac{p + 3}{4p + 12}$

2. $\frac{45v + 72}{v^2 + 4v - 21} \div \frac{45v + 72}{2v + 14}$

3. $\frac{4}{p - 4} - \frac{2}{p + 5}$

4.

	Horizontal Asymptote	Vertical Asymptote	Domain	Range
$f(x) = \frac{6x}{x+8}$				

Station 5: Polynomials

1. Consider this function and the synthetic division problems which follow. $f(x) = x^3 + x^2 - 8x - 8$

A) $\begin{array}{r rrrr} -1 & 1 & 1 & -8 & -8 \\ & & -1 & 0 & 8 \\ \hline & 1 & 0 & -8 & 0 \end{array}$	B) $\begin{array}{r rrrr} 2 & 1 & 1 & -8 & -8 \\ & & 2 & 6 & -4 \\ \hline & 1 & 3 & -2 & -12 \end{array}$
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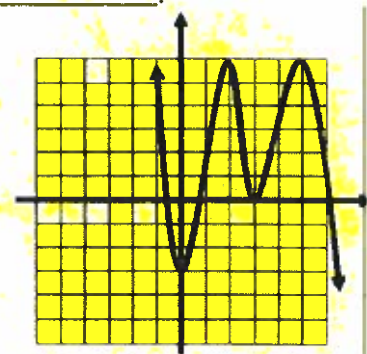
a What is the quotient (answer) in B? (You must interpret the synthetic division answer.)

b Can you determine a factor from either computation? If so, name the factor _____

c Can you determine a root from either computation? If so, name it _____

2. End Behavior: As $x \rightarrow +\infty$, $f(x) \rightarrow$ _____

As $x \rightarrow -\infty$, $f(x) \rightarrow$ _____



Station 1: Radical Expressions

Simplify:

1. $(2 + \sqrt{5})(1 - \sqrt{5})$

$$2 + \sqrt{5} - 2\sqrt{5} - 5$$

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

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

$$\boxed{2 + \sqrt{3}}$$

Write the rational exponents in radical form:

5. $4^{\frac{2}{3}}$

$$\sqrt[3]{4^2}$$

2. $\sqrt[3]{108} - 2\sqrt{75} + \sqrt{147}$

$$\sqrt[3]{27} \sqrt[3]{4} \quad \sqrt{\frac{25}{5}} \sqrt{3} \quad \sqrt{\frac{49}{7}} \sqrt{3}$$

$$3\sqrt[3]{4} - 10\sqrt{3} + 7\sqrt{3} = \boxed{3\sqrt[3]{4} - 3\sqrt{3}}$$

4. $\frac{\sqrt{60a^8}}{\sqrt{72a^5}}$

① ÷ # by 12 $\frac{\sqrt{5a^3} \cdot \sqrt{6}}{\sqrt{6} \cdot \sqrt{6}} = \frac{\sqrt{30a}}{6}$

Station 2: Complex Numbers

1. $\sqrt{-3} \cdot 5i$

$$i\sqrt{3} \cdot 5i$$

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

3. $(2 - i\sqrt{3})(2 + i\sqrt{3})$

Foil

$$4 - 2i\sqrt{3} + 2i\sqrt{3} \quad \boxed{-i^2 \cdot 3}$$

↓
+3

$$\boxed{7}$$

2. $(8 - 5i) - (-1 + 3i)$

$$8 - 5i + 1 - 3i$$

$$\boxed{9 - 8i}$$

4.

$$\frac{(7+2i)(4-5i)}{(4+5i)(4-5i)} = 16+25$$

$$(4+5i)(4-5i) = 16+25$$

$$28 + 8i - 35i - 10i^2$$

$$\boxed{\frac{38 - 27i}{41}}$$

Station 3: Logarithms

1. Evaluate each expression.

$$\log_7 343$$

$$\boxed{3}$$

2. Expand each logarithm.

$$\log_8 (a^6 b^5)$$

$$\boxed{6 \log_8 a + 5 \log_8 b}$$

3. Condense each expression to a single logarithm.

$$2 \log_4 x + 6 \log_4 y$$

$$\log_4 x^2 y^6$$

Solve each equation.

4. $\log_8 x = 4$

Around the world!

$$8^4 = x$$

$$\boxed{4096 = x}$$

5. $e^{2x} = 54$

use \ln

$$\frac{2x}{2} = \frac{\ln 54}{2}$$

$$\boxed{x = 1.9945}$$

Station 4: Rationals

1. $\frac{p^2 - 5p - 24}{8p - 64} \cdot \frac{p + 3}{4p + 12}$

~~$(p-8)(p+3)$~~

~~$8(p-8)$~~ ~~$4(p+3)$~~

$$\boxed{\frac{p+3}{32}}$$

2. $\frac{45v + 72}{v^2 + 4v - 21} \div \frac{45v + 72}{2v + 14}$

~~$9(5v+8)$~~ ~~$2(v+7)$~~

~~$(v+1)(v-3)$~~ ~~$9(5v+8)$~~

$$\frac{2}{v-3}$$

3. $\frac{4}{p-4} - \frac{2}{p+5}$

$$\frac{4(p+5) - 2(p-4)}{(p-4)(p+5)}$$

$$\frac{4p+20 - 2p+8}{(p-4)(p+5)}$$

$$\frac{2p+28}{(p-4)(p+5)} = \frac{2(p+14)}{(p-4)(p+5)}$$

4.

	Horizontal Asymptote	Vertical Asymptote	Domain	Range
$f(x) = \frac{8x}{x+5}$	$y=8$	$x=-5$	\mathbb{R}	\mathbb{R}

except $x=-5$ except $y=8$

Station 5: Polynomials

1. Consider this function and the synthetic division problems which follow. $f(x) = x^3 + x^2 - 8x - 8$

A) $-1 \mid \begin{array}{cccc} 1 & 1 & -8 & -8 \\ & -1 & 0 & 8 \\ \hline 1 & 0 & -8 & 0 \end{array}$	B) $2 \mid \begin{array}{cccc} 1 & 1 & -8 & -8 \\ & 2 & 6 & -4 \\ \hline 1 & 3 & -2 & -12 \end{array}$
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a) What is the quotient (answer) in B? (You must interpret the synthetic division answer.)

$x^2 + 3x - 2 \quad \frac{-12}{x-2}$

↓ remainder

b) Can you determine a factor from either computation? If so, name the factor $(x+1)$

c) Can you determine a root from either computation? If so, name it -1 .

2. End Behavior: As $x \rightarrow +\infty$, $f(x) \rightarrow -\infty$

As $x \rightarrow -\infty$, $f(x) \rightarrow \infty$

