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Intermediate II Term 1 Final Review

1.1 Rational Numbers

Writing Fractions or Mixed Numbers as Decimals.

-The fraction line means divide

-You can make mixed numbers improper and then divide or put the whole number in front and divide the fraction part

Write each Fraction as a decimal	
1. $-\frac{1}{9}$ 1÷9 $-0.\overline{1}$	2. $-6\frac{2}{35}$ 2÷35 -6.05714286
3. $\frac{5}{8}$ 5÷8 0.625	4. $4\frac{13}{25}$ 13÷25 4.52

Writing Decimals as Fractions

Terminating Decimals:

1. Place Value
2. Reduce
3. Whole Number in Front

Repeating Decimals

1. Put repeating decimals over 9s (the number of repeating decimals is the number of 9s)
2. Reduce
3. Put the whole number in front

Write each decimal as a fraction SIMPLIFY COMPLETELY	
5. 2.023 $2\frac{23}{1000}$	6. $0.\overline{3}$ $\frac{3\div3}{9\div3}$ $\frac{1}{3}$
7. $0.\overline{45}$ $\frac{45\div9}{99\div9}$ $\frac{5}{11}$	8. -7.32 $-7\frac{32\div2}{100\div2}$ $-7\frac{16\div2}{50\div2}$ $-7\frac{8}{25}$

1.2 Powers and Exponents

-A product of repeated factors can be expressed as a power, that is using an exponent and a base.

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-Example: $2 \cdot 2 \cdot 2 \cdot 2 = 2^4$ where 2 is the base, or the common factor, and 4 is the exponent

Write each expression using exponents.	
1. $(-2) \cdot (-2) \cdot (-2) \cdot 3 \cdot 3 \cdot 3 \cdot 3$ $(-2)^3 \cdot 3^4$	2. $a \cdot b \cdot b \cdot a \cdot b$ a^2b^3
Evaluate	
3. Evaluate $\left(-\frac{2}{3}\right)^4$ $\left(-\frac{2}{3}\right)\left(-\frac{2}{3}\right)\left(-\frac{2}{3}\right)\left(-\frac{2}{3}\right) = \boxed{\frac{16}{81}}$	
Evaluate the expression. Assume a=2 and b=4 for questions 4 and 5.	
4. $a^3 + b^2$ 2^3+4^2 $8+16$ $\boxed{24}$	5. $(a - 2b)^2$ $(2-2(4))^2$ $(2-8)^2$ $(-6)^2$ $\boxed{36}$

1.3 Multiply and Divide Monomials

- To multiply powers with the same base, add their exponents
- To divide powers with the same base, subtract their exponents

Simplify using the laws of exponents for questions 8-11.	
1. $\frac{36x^7}{4x}$ $\frac{9 \cdot \cancel{36} \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x}{\cancel{4} \cdot \cancel{x}}$ $\boxed{9x^6}$	2. $(-4ab)(3a^2)$ $-4 \cdot a \cdot b \cdot 3 \cdot a \cdot a$ $\boxed{-12a^3b}$
3. $-2m(-8m^5)$ $-2 \cdot m \cdot -8 \cdot m \cdot m \cdot m \cdot m \cdot m$ $\boxed{16m^6}$	4. $\frac{y^8}{y^5}$ $\frac{y \cdot y \cdot y \cdot y \cdot y \cdot y \cdot y \cdot y}{y \cdot y \cdot y \cdot y \cdot y}$ $\boxed{y^3}$

1.4 Powers of Monomials

-To find the power of a power, multiply the exponents

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-To find the power of a product, find the power of each factor and multiply

1. $(4^2)^3$ 4^6	2. $[(x^2)^3]^7$ x^{42}
3. $(7x^2y^5z^3)^4$ $7^4x^8y^{20}z^{12}$	4. $(9q^3)^4$ 9^4q^{12}

1.5 Negative Exponents

- Any nonzero number to the zero power is 1.
- Any nonzero number to the negative n power is the multiplicative inverse of its nth power (happy fence)

Write each expression using a positive exponent.	
1. x^{-7} $\frac{1}{x^7}$	2. 5^0 1
3. $\frac{y^{-2}}{y^{-5}}$ $-2+5$ y^3	4. $p^{-3}p^{10}$ $-3+10$ p^7

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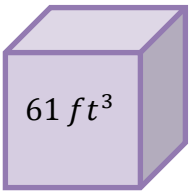
1.8 Roots

-A square root of a number is one of its two equal factors
-A cube root of a number is one of its three equal factors

Solve each equation. Check your solution.	
1. $k^2 = 36$ $k=6,-6$	2. $r^2 = \frac{25}{49}$ $r=\frac{5}{7},-\frac{5}{7}$
Find each cube root.	
3. $\sqrt[3]{512}$ 8	4. $\sqrt[3]{\frac{27}{64}}$ $\frac{3}{4}$
5. Given the area of the square, find the perimeter. Area= 81 square feet $\sqrt{81}=9$ $9 \cdot 4 = 36$ ft	

1.9 Estimate Roots

-Find the closest perfect square or perfect cube.
-Estimate to the nearest integer.

Estimate to the nearest integer.	
1. $\sqrt{80}$ $\sqrt{81}=9$ ≈ 9	2. $\sqrt[3]{330}$ $\sqrt[3]{343}=7$ ≈ 7
3. The volume of the cube is given. Estimate the side length of the cube to the nearest integer. Use the formula $V = s^3$. $\sqrt[3]{61}$ $\sqrt[3]{64}=4$ ≈ 4 ft 	

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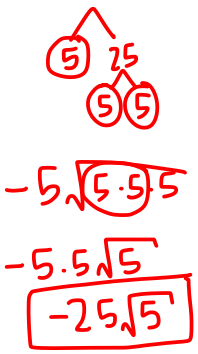
1.95 Simplify Radicals

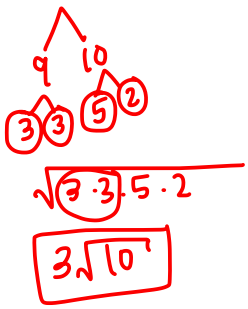
-Find the prime factorization of the radicand
-Find pairs of the prime factors
-Pull one of each pair outside of the radical

Simplify.

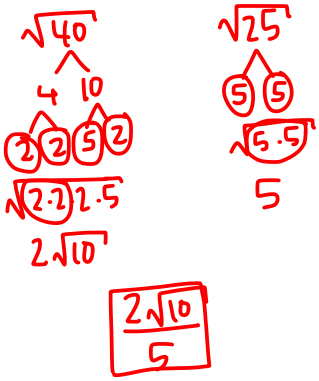
1. $-5\sqrt{125}$



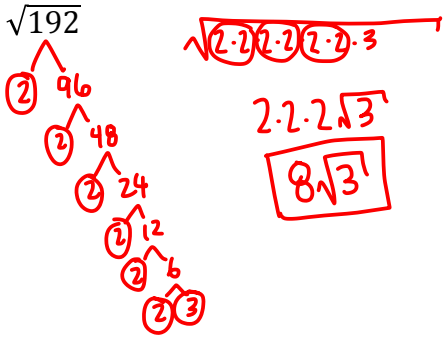
2. $\sqrt{90}$



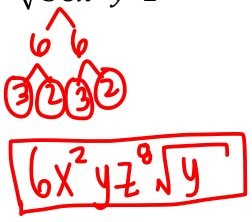
3. $\sqrt{\frac{40}{25}}$



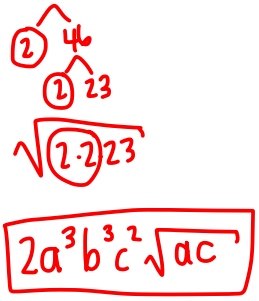
4. $\sqrt{192}$



5. $\sqrt{36x^4y^3z^{16}}$



6. $\sqrt{92a^7b^6c^5}$



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1.10 Compare Real Numbers

-A rational number is a number that can be written as a fraction, where the denominator is not zero

-The decimal form of a rational number is a terminating or repeating decimal.

-You can compare and order real numbers by writing them in the same as a decimal before comparing or ordering them

Use estimation to fill in each circle with <, >, or = to make the statement true.

1. 3 $\sqrt{9}$ $<$ $\sqrt{12}$

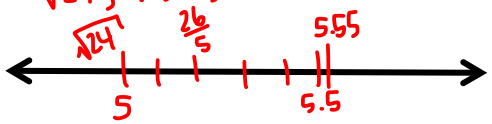
2. $\sqrt{50}$ $>$ $\sqrt{49}$ 7

3. $\sqrt{75}$ $>$ $\sqrt{64}$ 8

Order each set of numbers from least to greatest. Then graph using a number line.

4. $5.55, 5.5, \sqrt{24}, \frac{26}{5}$

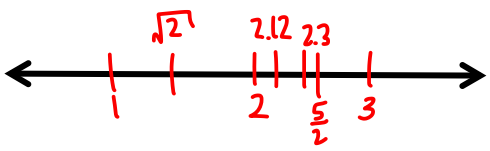
$\sqrt{24}, 5.2, 5.5, 5.55$ (4.9, 5.2)



5. $2.3, \sqrt{2}, 2.12, \frac{5}{2}$ 2.5

1.41

$\sqrt{2}, 2.12, 2.3, \frac{5}{2}$



Order each set of numbers from least to greatest.

6. $\{4, 7, \sqrt{17}, \sqrt{46}\}$ ($\sqrt{16}$ $\sqrt{49}$)

$4, \sqrt{17}, \sqrt{46}, 7$

7. $\{\sqrt{3}, 2, 5, \sqrt{30}\}$ ($\sqrt{4}$ $\sqrt{25}$)

$\sqrt{3}, 2, 5, \sqrt{30}$

Classifying Real Numbers. State whether the following numbers are rational or irrational and explain how you know.

8. $\sqrt{26}$

Irrational, non-repeating non-terminating

9. $0.\overline{3}$

Rational, can be written as a fraction

10. $\sqrt[3]{125}$

Rational, Can be written as a fraction

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