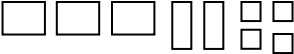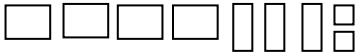# Math Review Questions

Rational numbers:

- **Compare and order rational numbers.**
  Order from least to greatest:
  $1.2, -7, \frac{17}{1000}, \frac{-76}{1000}$
- **Identify a rational number between two given rational numbers.**
  Find a number between $\frac{6}{14}$ and $\frac{7}{14}$
- **Perform operations on rational numbers in decimal form without a calculator.**
  Evaluate $0.6 \div -0.2 + 0.5 \times 0.3^2$
- **Solve problems involving rational numbers in fraction form.**
  Evaluate $\frac{1}{7} + \frac{17}{21} \times (\frac{6}{7})^3$
- **Determine the square root of a perfect square rational number without a calculator.**
  Find $\sqrt{256}$
- **Determine an approximate square root of a non-perfect square rational number without a calculator.**
  Find $\sqrt{90}$

Exponents:

- **Represent repeated multiplication with exponents**
  What is 5x5x5x5x5x5 as an exponent?
- **Describe how powers represent repeated multiplication**
  How does 3^4 represent 3x3x3x3?
- **Demonstrate the difference between the exponent and the base by building models of a given power, such as 2^3 and 3^2**
  What shape could 2^3 represent? What shape could 3^2 represent? How so?
- **Demonstrate the difference between two given powers in which the exponent and base are interchanged by using repeated multiplication, such as 2^3 and 3^2.**
  Show 3^4 and 4^3 with repeated multiplication. Explain how they are different.
- **Explain the role of parentheses in powers by evaluating a give set of powers such as $(-2)^4, (-2^4)$ and -2^4.**
  What is the difference between $(-3)^2$, (-3^2) and -3^2?
- **Evaluate powers with integral bases (excluding base 0) and whole number exponents.**
  Find 8^6
- **Explain the exponent laws for multiplying and dividing powers with the same base.**
  Simplify $3^2 \times 3^5$ and $2^{11} \div 2^6$. What are the exponent laws?
- **Explain the exponent law for raising a power to an exponent.**
  Simplify $(4^3)^2$. What is the exponent law?
- **Explain the exponent law for powers with an exponent of zero.**
  $2^0 = 1$. Why is this?
- **Use patterns to show that a power with an exponent of zero is equal to one.**
  Use a pattern to show that $3^0 = 1$.
- **Identify the error in a simplification of an expression involving powers.**
  What is wrong with $4^3 - 8 \div 2 + 3^2 = 17$

- ○ **Apply the laws of exponents.**
  Evaluate $12 \times 5^3 - 64 \div 4^2$
- ○ **The order of operations on expressions with powers.**
  Evaluate $9 + (-2)^3 - 2(-6)^2$
- ○ **Determine the sum and difference of two powers.**
  Evaluate $6^3 - 2^4$ and $6^3 + 2^4$
- ○ **Identify the error in applying the order of operations in an incorrect solution.**
  What is wrong with $2 + 15 \times 3^2 + 2(2^2) = 620$
- ○ **Use powers to solve problems.**
  Find the surface area and volume of a cube with a side length of 9cm
- ○ **Solve problems by applying the order of operations.**
  Evaluate $24 - 2^2 \times 3 + (7^2 - 5^2)$

Polynomials:

- ○ **Use mathematical terminology (variables, degree, number of terms, coefficients, constant terms) to describe polynomials.**
  Too find the _____ of a polynomial you take the _____ exponent
- ○ **Identify different types of polynomials (monomial, binomial, trinomial).**
  Show a monomial, binomial and trinomial
- ○ **Create a model for a given polynomial expression.**
  Create a model for $2x^2 - 3x + 6$
- ○ **Write the expression for a given model of a polynomial.**
  Write an expression for ▭▭▭ ▯▯ ▤▤
- ○ **Write a polynomial expression for a given situation.**
  In Langley you can rent a backhoe for $399 per day and a bulldozer for $550 per day. It costs $160 round trip to move each piece of equipment back and forth to the job site. Write an expression for the total cost of renting both the backhoe and bulldozer for 5 days.

- ○ **Use algebra tiles to show whether expressions are equivalent**
  Are $-3x^2 - 4x - 2$ and ▯ ▭▭▭ ▯▯ ▯▤

Math Review Questions WITH ANSWERS

Rational numbers:

- ○ **Compare and order rational numbers.**
  Order from least to greatest:
  $1.2, -7, \frac{17}{1000}, \frac{-76}{1000}$
  $-7, \frac{-76}{1000}, \frac{17}{1000}, 1.2$
- ○ **Identify a rational number between two given rational numbers.**
  Find a number between $\frac{6}{14}$ and $\frac{7}{14}$
  A number between would be $\frac{13}{28}$

- Perform operations on rational numbers in decimal form without a calculator.
  Evaluate $0.6 \div -0.2 + 0.5 \times 0.3^2$

  -3 + 0.45

  -2.55
- Solve problems involving rational numbers in fraction form.
  Evaluate $\frac{1}{3} + \frac{17}{21} \times \left(\frac{6}{7}\right)^3$

  $\left(\frac{6}{7}\right)^3 = \frac{216}{343}$

  $\frac{1}{7} + \frac{17}{21} \times \frac{216}{343}$

  $\frac{1}{7} + \frac{17}{7} \times \frac{72}{343}$

  $\frac{1}{7} + \frac{1224}{2401} = \frac{1567}{2401}$
- Determine the square root of a perfect square rational number without a calculator.
  Find $\sqrt{256}$

  The square root of 256 is 16
- Determine an approximate square root of a non-perfect square rational number without a calculator.
  Find $\sqrt{90}$

  Between 9 and 10, 9.5

Exponents:

- **Represent repeated multiplication with exponents**
  What is 5x5x5x5x5x5 as an exponent?

  5^6
- **Describe how powers represent repeated multiplication**
  How does 3^4 represent 3x3x3x3?

  It shows 3 multiplying itself 4 times

- **Demonstrate the difference between the exponent and the base by building models of a given power, such as 2^3 and 3^2**
  What shape could 2^3 represent? What shape could 3^2 represent?

  2^3 represents a cube, and 3^2 represents the surface area of a square
- **Demonstrate the difference between two given powers in which the exponent and base are interchanged by using repeated multiplication, such as 2^3 and 3^2.**
  Show 3^4 and 4^3 with repeated multiplication. Explain how they are different.

  3x3x3x3 and 4x4x4. 3^4 is 3 multiplying itself 4 times. 4^3 is 4 multiplying itself 3 times.
- **Explain the role of parentheses in powers by evaluating a give set of powers such as $\left(-2\right)^4, \left(-2^4\right)$ and -2^4.**
  What is the difference between $(-3)^2$, (-3^2) and -3^2?

  $(-3)^2 = (-3)(-3) = -27$

  (-3^2) and $-3^2 = -1 \times 3 \times 3 = -9$
- **Evaluate powers with integral bases (excluding base 0) and whole number exponents.**
  Find 4^6

  16 777 216
- **Explain the exponent laws for multiplying and dividing powers with the same base.**
  Simplify $3^2 \times 3^5$ and $2^{11} \div 2^6$. What are the exponent laws?

3^7 and 2^5. *When multiplying powers with the same base you add the exponents. When dividing powers with the same base you subtract the exponents*

- ○ **Explain the exponent law for raising a power to an exponent.**
  Simplify $(4^3)^2$. What is the exponent law?
  4^6. When multiplying a power with another exponent, multiply the exponents
- ○ **Explain the exponent law for powers with an exponent of zero.**
  $2^0 = 1$. Why is this?
  $2 \div 2 = 1$. If a number has an exponent of 0, the value will always be 1 as long as the base is not 0.
- ○ **Use patterns to show that a power with an exponent of zero is equal to one.**
  Use a pattern to show that $3^0 = 1$.

Power	Value
3^4	81
3^3	27
3^2	9
3^1	3
3^0	1

  81/3 = 27. 27/3 = 9. 9/3 = 3. 3/3 = 1.

- ○ **Identify the error in a simplification of an expression involving powers.**
  What is wrong with $4^3 - 8 \div 2 + 3^2 = 17$
  They said 4^3 is equal to 12 not 64.
- ○ **Apply the laws of exponents.**
  Evaluate $12 \times 5^3 - 64 \div 4^2$
  1496
- ○ **The order of operations on expressions with powers.**
  Evaluate $9 + (-2)^3 - 2(-6)^2$
  -71
- ○ **Determine the sum and difference of two powers.**
  Evaluate $6^3 - 2^4$ and $6^3 + 2^4$
  200 and 232
- ○ **Identify the error in applying the order of operations in an incorrect solution.**
  What is wrong with $2 + 15 \times 3^2 + 2(2^2) = 620$
  They did not use the order of operations at all
- ○ **Use powers to solve problems.**
  Find the surface area and volume of a cube with a side length of 9cm
  SA = 81 cm²
  V = 729 cm³
- ○ **Solve problems by applying the order of operations.**
  Evaluate $24 - 2^2 \times 3 + (7^2 - 5^2)$
  36

Polynomials:

- **Use mathematical terminology (variables, degree, number of terms, coefficients, constant terms) to describe polynomials.**
  Too find the __degree___ of a polynomial you take the __biggest___ exponent
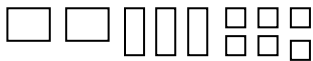- **Identify different types of polynomials (monomial, binomial, trinomial).**
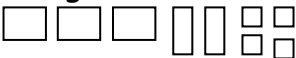 Show a monomial, binomial and trinomial
  $3x^2$, 4x + 2, $6x^2$ – 8x + 5
- **Create a model for a given polynomial expression.**
  Create a model for $-2x^2 – 3x - 6$

- **Write the expression for a given model of a polynomial.**
  Write an expression for
  $-3x^2$ – 2x - 4
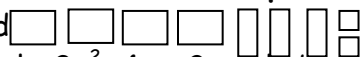- **Write a polynomial expression for a given situation.**
  In Langley you can rent a backhoe for $399 per day and a bulldozer for $550 per day. It costs $160 round trip to move each piece of equipment back and forth to the job site. Write an expression for the total cost of renting both the backhoe and bulldozer for 5 days.
  399x + 550x + 320
  399(5) + 550(5) + 320
  1995 + 2750 + 320 = $5065

- **Use algebra tiles to show whether expressions are equivalent**
  Are $-3x^2$- 4x - 2 and
  No they are not equal, $-3x^2$- 4x – 2 would be: