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Divisibility by 2 (pg. 4 - 6)

- ➡ If the number in the ones place is even then the number is divisible by 2.
  Example: 2040**2** is even and therefore divisible by 2

Divisibility by 3 (pg. 7 - 10)

- ➡ If the sum of all the digits of a number is divisible by 3 then the number is divisible by 3.
  Example: 4593 is divisible by 3 (4+5+9+3 = 21, 21÷ 3 = 7)

Divisibility by 4 (pg. 15 - 18)

- ➡ Multiply the ten's digit by 2 and add the product to the ones digit. If the sum is divisible by 4 then so is the number.
  Example: 74**44** is divisible by 4 (4x2 = 8, 8+4 = 12, 12÷4 = 3)

Divisibility by 5 (pg. 4 - 6)

- ➡ If the number has a 5 or a 0 in the ones place then it is divisible by 5.
  Example: 56749**5** has a 5 in the ones and is therefore divisible by 5.

Divisibility by 6 (pg. 12 - 14)

- ➡ If the number is divisible by 2 and 3, then it is divisible by 6.
  Example: 3264 is divisible by 6 (It is even and 3+2+6+4= 15, 15÷3 = 5)

Divisibility by 8 (pg. 15 - 18)

- ➡ Multiply the hundred's digit by 4 and the ten's digit by 2 and add the product to the ones digit. If the sum is divisible by 8 then so is the number.
  Example: 4**248** is divisible by 8 (2x4 = 8, 4x2 = 8, 8+8+8 = 24, 24÷8 = 3)

Divisibility by 9 (pg. 7 - 10)

- ➡ If the sum of all the digits of a number is divisible by 9 then the number is divisible by 9.
  Example: 45729 is divisible by 9. (4+5+7+2+9= 27, 27÷9 = 3)

Divisibility by 10 (pg. 4 - 6)

- ➡ If the number in the ones place is a 0, then it is divisible by 10.
  Example: 456070 has a 0 in the ones and is therefore divisible by 10.

Common Multiples (pg 22 - 25)

- ➡ A number that is a multiple of two or more given numbers.
- ➡ LCM
  Example: 12, 24, and 36 are common multiples of 4 and 6.

Common Factors (pg 26 - 29)

- ➡ A whole number that divides into two or more other whole numbers with no remainder.
- ➡ GCF
  Example: 4 is a common factor of 12 and 24.

Comparing Fractions (pg. 47-46)

- ➡ Write fractions in lowest terms.
  Example: $\frac{3}{6} -> \frac{1}{2}$
- ➡ Convert from improper to mixed fraction.
  Example: $\frac{7}{4} -> 1\frac{3}{4}$
- ➡ Convert from mixed to improper fraction.
  Example: $2\frac{3}{4} -> \frac{11}{4}$

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- ➡ Write fractions with a common denominator.
  Example: $\frac{3}{4}, \frac{5}{8} -> \frac{6}{8}, \frac{5}{8}$
- ➡ Order fractions on a number line

Adding and Subtracting Fractions (pg. 77)

- ➡ Convert fractions to equivalent denominator then add the fractions.
- ➡ Convert fractions to equivalent denominator then subtract the fractions.
  1. Times the denominators until they are equivalent. $\frac{3}{4} x 2 + \frac{5}{8}$
  2. Rewrite the equations with equivalent fractions. $\frac{6}{8} + \frac{5}{8}$
  3. Add/Subtract the numerators. The denominators remain the same. 6+5 = 11
  4. Get your answer. $\frac{11}{8}$

Adding and Subtracting Fractions Mixed Numbers (pg. 84-85)

- ➡ Convert fractions to improper fractions with common denominator then add or subtract.
- ➡ Add or subtract whole numbers and then add or subtract the fractions separately. Then add the results together to get your answer.

Converting mixed number to improper fractions
1. Times the denominator by the whole number.
2. Add the numerator to the product.
3. The denominator remains the same.

Example: $2\frac{3}{4}$ —> (4x2) + 3 = 11 —> $\frac{11}{4}$

Adding and Subtracting Decimals (pg. 104-105)

- ➡ Line up the decimals and add/subtract like normal.

Example:
```
  1.614
  5.341
+ 2.172
  9.127
```

Multiplying with Decimals (pg. 109, and 112-113)

- ➡ When multiplying a positive number by a number that is less than one, the product should be less than the original number.
- ➡ When multiplying with decimals, we can multiply as normal and make sure that the product has the same number of decimal places as the question.

Example: 3.4 x 0.2
= 0.68

Example: 1.2m x 2.4
= 2.88

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Division with Decimals (pg. 123)

➡ Steps for division with decimals

1. Move the decimal in the divisor right until it no longer exists.
2. Move the decimal in the dividend the same number of places as you move it in the divisor.
3. Place the decimal in the quotient directly above the one in the dividend.

Example:

5.43 (Dividend) ÷ 0.3 (Divisor) = 18.1 (Quotient)
->> 5.43 ÷ 0.3
->> Changed to 54.3 ÷ 3
= 18.1

Order of Operation with Decimals (pg. 130-131)

➡ BEDMAS
Brackets, Exponents, Division, Multiplication, Addition and Subtraction.
Example: 32.28 - (<u>1.2 ÷ 4</u> + 3.2)
= 32.28 - (<u>1.2 ÷ 4</u> + 3.2)
= 32.28 - (<u>0.3 + 3.2</u>)
= 32.28 - (3.5)
= 28.78

Expressing Fractions as Decimals (pg. 136-137)

➡ Attempt to write the fraction as an equivalent fraction out of 10, 100, or 1000 etc..
Example: 2/5 = 4/10 —> 0.4

➡ Use a calculator. Divide the numerator by the denominator.

➡ Terminating decimals come to an end.
Example: 0.45

➡ Repeating Decimals continue on forever.
Example: 0.454545454545…. Or 0.45

Expressing Decimals as Fractions (pg. 140)

➡ When converting terminating decimals into fraction the numerator will be whatever the decimal is and the denominator will be the power of ten that matches the final place value.
Example: 0.25 = 25/100
twenty five hundredths

➡ When converting repeating decimals into fractions the numerator will be whatever the decimal is and the denominator will be 9, 99, 999, etc. that matches the final place value.
Example: 0.777777 = 7/9

➡ If you add a whole number make the fraction a mixed fraction.
Example: 1.25 = 1 25/100

Percent as Fractions and Decimals (pg. 155)

➡ Fraction to Percent - Convert fraction to equivalent fraction with a denominator of 100. Because percent is parts out of 100, the numerator is the percentage.
Example: 2/5 —> 40/100 —> 40%

➡ Decimal to Percent - Take the decimal and convert it to a fraction out of 100. Because percent is parts out of 100, the numerator is the percentage.
Example: 0.75 —> 75/100 —> 75%

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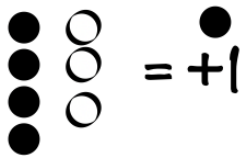
Calculating with Percent (pg. 169)

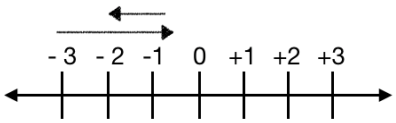
- ➡ Calculating Number from percent and total number. Convert percentage to decimal and times the decimal the total amount.
  Example: 50% of 20 —> 0.50 x 20 = 10 —> 50% of 20 is 10
- ➡ Calculating Total Number from percent and amount of that percent. Convert percentage to fraction (write in lowest terms in needed), Write equivalent fractions with missing term, find missing term.
  Example: 25% of __ = 22
  25/100 = 22/? —> 1/4 = 22/? —> 1/4 = 22/88 —> 25% of 88 = 22
- ➡ Calculating Tip and Tax for given amount.
  Example: 5% Tax on $45
  0.05 x $45 = $2.25
  $45 + $2.25 = $47.25

Adding Integers (pg. 242)

- ➡ SIGNS THE SAME - Add the absolute value of the numbers and keep the same sign.
  Example: (+5) + (+3) = (+8) and (-5) + (-3) = (-8)
- ➡ SIGNS DIFFERENT - Subtract the absolute value of the numbers and keep the sign of the bigger number.
  Example: (-4) + (+3) = (-1) and (+4) + (-3) = (-1)
- ➡ Addition with counters - pair up the positives and negative chips. Pairs cancel each other out. Remaining chips are the answer.
  Example: (+4) + (-3) = (+1)



- ➡ Addition with number line - When adding integers using a number line, we use the first integer as our starting point and move RIGHT for positive and LEFT for negative integers.
  Example: (-3) + (+2) + (-1) = (-2)



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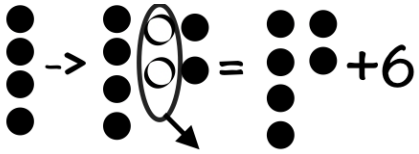
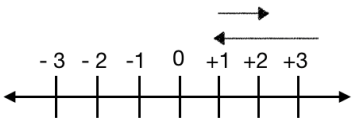
Subtracting Integers (pg. 261)

- ➡ KEEP, CHANGE, CHANGE - Keep the sign of the first number, change the subtraction sign to addition, and change the sign of the second number to the opposite sign. Once this has been completed, use the same rules as addition.
  Example: (+4) - (-4) —> (+4) + (+4) = (+8)
- ➡ Subtraction with counters - When subtracting take the second number away from the first. Add zero (+ and - counters) if there are not enough counters to take away.
  Example: (+4) - (-2) = (+6)

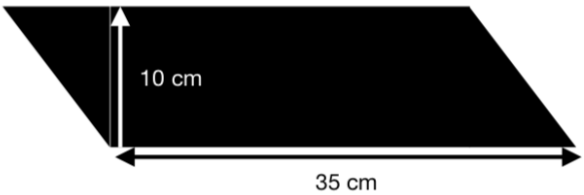


- ➡ Subtraction with number line - When subtracting integer using a number line, move the opposite direction as we would if we were adding. LEFT for positive and RIGHT for negative.
  Example: (+3) - (+2) - (-1) = (+2)



Area of Parallelograms (pg. 194)

- ➡ Area = base x height or A = b x h
- ➡ The height must be a vertical height not a slanted one. The height should be a 90° angle from the base.



Example: A = 35cm x 10 cm
A = 350 cm^2

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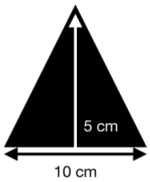
Area of Triangles (pg. 200)

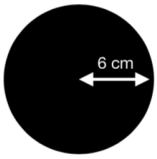
➡ Area = $\frac{\text{base x height}}{2}$ or A = $\frac{\text{b x h}}{2}$

➡ The height must be a vertical height not a slanted one. The height should be a 90° angle from the base.



Example: A = (5cm x 10cm) / 2
A = 25 cm^2

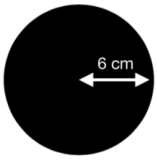
Area of Circles (pg. 220)



➡ Area = Pi x radius x radius or A = π x r^2
Example: A = 3.14 x 6cm x 6cm
A = 113.09cm^2

Circumference (pg. 208)

➡ Circumference = Pi x diameter or 2 x Pi x Radius



➡ Circumference = π x d or 2 x π x r
Example: C = 2 x 3.14 x 6cm
C = 37.70cm

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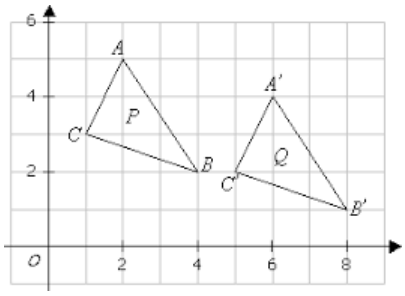
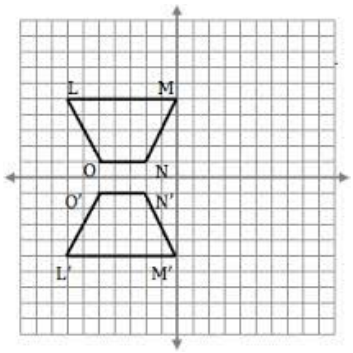
Translations (pg. 290)

➡ Is the result of a slide along straight lines up and down or left or right.



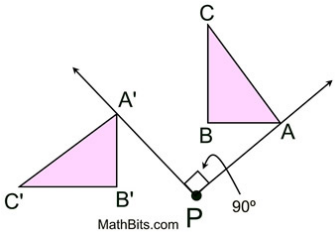
Reflections (pg. 290)

➡ Is the result of a flip of a 2D object. Each point in the 2D shape flips to the opposite side of the line of reflection, but stays the same distance from the line.



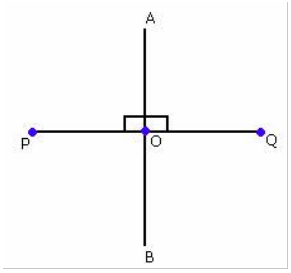
Rotations (pg. 296)

➡ A turn in which a shape moves about a fixed point through the same angle.



Perpendicular Bisectors (pg. 307)

➡ A line that intersects a line segment at 90 degrees and divides it in two.



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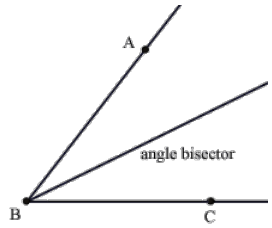
Parallel Lines (pg. 315)

➡ Line segments that are equal distance and never meet.

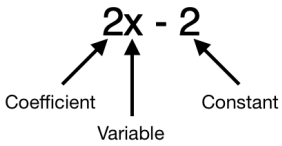
Angle Bisectors (pg. 319)

➡ A line that cuts an angle in half to form two equal angles.



Parts of an Expression (pg. 376)

➡ Coefficient - The number that is the multiplier of a variable.
➡ Variable - A letter or a symbol that represents a number
➡ Constant - A quantity that does not change and makes the expression true.



Equations vs Expressions (pg. 401)

➡ Expression —> 2x - 2
➡ Equation —> 2x - 2 = 4

Evaluating Equations (pg. 401)

➡ The central concept of algebra is balance. We create balance by the addition of opposites.
➡ Addition and Subtraction are opposites
➡ Division and Multiplication are opposites

Example: 4x - 2 = 6
+2 +2
4x = 8
4 4

x = 2

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Range (pg. 336)

➡ The range of a data set is the difference between the greatest and least value in a data set.

Example: 4, 5, 8, 10, 12

Range = 12 - 4

Range = 8

Median (pg. 340)

➡ The median is a representative value of a set of data; it is the middle value of the ordered data.

Example: 2, 3, 4, 5, 6

Median = 4

Example: 2, 3, 4, 5

Median = 3.5

Mode (pg. 340)

➡ The mode is a representative value of a set of data; it is the value or item that occurs most often in a set of data.

Example: 1, 2, 3, 4, 4, 5, 5, 5, 6

Mode = 5

Mean (pg. 346)

➡ The mean is a representative value of a set of data. The mean is determined by sharing the sum of the data evenly among the values in the set (add up the total value and divide by the total number of values).

Example: 2, 3, 4, 5, 6

Mean = (2 + 3 + 4 + 5 + 6) / 5

Mean = 20 / 5

Mean = 4

Outlier (pg. 356)

➡ An outlier is a data value that is far from the other data values in a data set. Consider what would happen if the value wasn't included.

Example: 11, 11, 12, 14, 15, 17, 30

Outlier = 30

Events (pg. 430)

➡ An event is a set of one or more outcomes in a probability experiment.

Example: Rolling a six sided die

Outcomes = 1, 2, 3, 4, 5, and 6.

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Probability (pg. 431)

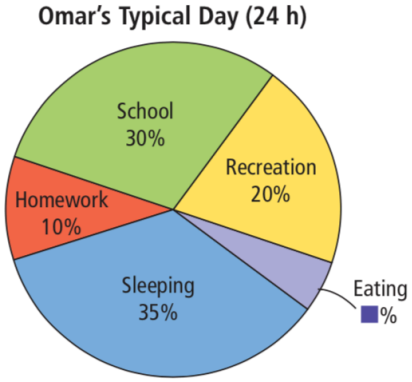
- ➡ The measure of the likelihood that an event will occur. The probability of an event is most commonly shown as a fraction. The numerator of the fraction is the number of desirable outcomes and the denominator is the total number of outcomes.

$$\text{Probability} = \frac{\text{Desirable Outcomes}}{\text{Total Outcomes}}$$

- ➡ When probabilities are smaller it implies that the event is less likely to happen. When they are greater, the event is more likely to happen.
  Example: Rolling a 1 on a six-sided die
  P (Rolling 1) = 1 / 6

Circle Graph (pg. 468)

- ➡ A graph that shows how parts make up a whole.
- ➡ The sum of all the percents in a circle graph is 100%
- ➡ Find the actual amount of a sector - convert the percentage into a decimal and multiply the total amount the graph represents.



- ➡ Find a missing sector - Add up all the sector, subtract this number from 100.
  Example: Number of hours spent on school
  0.30 x 24 = 7.2 hrs
  Example: Percent of time spent on Eating
  30% + 10% + 35% + 20% = 95%
  100% - 95% = 5%
  Eating = 5%