



Final HiSet Math Review

Last minute review for students
ready to take the HiSet



Order of Operation

Evaluate the problem in the following order:

1. P - Parentheses
2. E - Exponents (Powers and Square Roots)
3. MD - Multiplication and Division (Left to Right)
4. AS - Addition and Subtraction (Left to Right)

You can remember the order by saying:

Please Excuse My Dear Aunt Sally

(), X^2 and $\sqrt{\quad}$, \times and \div , + and -



Practice Problems

$$3 + 2 \times 5 + 8 \times 2$$

$$10 - 6 + 2(3 + 1)^2$$



Practice Problems

$$3 + 2 \times 5 + 8 \times 2$$

$$\begin{aligned} &3 + 2 \times 5 + 8 \times 2 \\ &3 + 10 + 16 \\ &13 + 16 \\ &29 \end{aligned}$$

$$10 - 6 + 2(3 + 1)^2$$

$$\begin{aligned} &10 - 6 + 2(3 + 1)^2 \\ &10 - 6 + 2(4)^2 \\ &10 - 6 + 2(16) \\ &10 - 6 + 32 \\ &4 + 32 \\ &36 \end{aligned}$$



Evaluating Algebraic Expressions

Find the value of an algebraic expression by substituting a number for each variable and then using the correct order of operations.

Word problems involving formulas and also function problems can be solved using the substitution method as well.



Practice Problems

Find the value of $3y - 7$
when $y = 5$

Find the value of $2(x + y)^2 - 4x$
when $x = 5$ and $y = -2$



Practice Problems

Find the value of $3y - 7$ when $y = 5$

$$\begin{aligned} & 3y - 7 \\ & 3(5) - 7 \\ & 15 - 7 \\ & 8 \end{aligned}$$

Find the value of $2(x + y)^2 - 4x$ when $x = 5$ and $y = -2$

$$\begin{aligned} & 2(x + y)^2 - 4x \\ & 2(5 + -2)^2 - 4(5) \\ & 2(3)^2 - 4(5) \\ & 2(9) - 4(5) \\ & 18 - 20 \\ & -2 \end{aligned}$$



Practice Problems

Find the value of $c/d + 3c - 2d$
when $c = 8, d = 4$

Evaluate the expression
 $-3abc + c$ if $a = -1, b = 4, c = -2$



Practice Problems

Find the value of $c/d + 3c - 2d$
when $c = 8, d = 4$

$$\begin{aligned}c/d + 3c - 2d \\8/4 + 3(8) - 2(4) \\2 + 24 - 8 \\26 - 8 \\18\end{aligned}$$

Evaluate the expression
 $-3abc + c$ if $a = -1, b = 4, c = -2$

$$\begin{aligned}-3abc + c \\-3(-1)(4)(-2) + -2 \\3(4)(-2) + -2 \\12(-2) + -2 \\-24 + -2 \\-26\end{aligned}$$



Practice Word Problem

To convert a temperature from Celsius to Fahrenheit, use the formula $F = 1.8C + 32$, where F is degrees Fahrenheit and C is degrees Celsius. What is the temperature in degrees Fahrenheit when the temperature is -5 degrees Celsius?



Practice Word Problem

To convert a temperature from Celsius to Fahrenheit, use the formula $F = 1.8C + 32$, where F is degrees Fahrenheit and C is degrees Celsius. What is the temperature in degrees Fahrenheit when the temperature is -5 degrees Celsius? (This means $C = -5$)

$$F = 1.8C + 32$$

$$F = 1.8(-5) + 32$$

$$F = -9 + 32$$

$$F = 23 \text{ degrees}$$



Practice Problems

$$f(x) = 2x + 4 \text{ find } f(3)$$

$$f(x) = -3x - x \text{ find } f(-2)$$



Practice Problems

$$f(x) = 2x + 4 \text{ find } f(3)$$

$$f(3) = 2(3) + 4$$

$$f(3) = 6 + 4$$

$$f(3) = 10$$

$$f(x) = -3x - x ; f(-2)$$

$$f(-2) = -3(-2) - (-2)$$

$$f(-2) = 6 - (-2)$$

$$f(-2) = 8$$



Polynomials

A polynomial is an algebraic expression that contains one or more terms combined by addition or subtraction.

Examples: $9d + 6$, $4x + 6y - z$, $5xy^2 + 3(x-4)$



Practice Problems

Simplify each expression.

1. $6v^2 + 3v + 2v - 4v^2 + 5$

2. $4z - z + 3vz + 2 - 5vz$

3. $3x^2(2x^2 + 4xy - 2)$

4. $(2x + 3)(4x + 1)$



Practice Problems

1. $6v^2 + 3v + 2v - 4v^2 + 5$
 $2v^2 + 5v + 5$

2. $4z - z + 3vz + 2 - 5vz$
 $3z - 2vz + 2$

3. $3x^2(2x + 4xy - 2)$
 $6x^3 + 12x^3y - 6x^2$

4. $(2x + 3)(4x + 1)$
 $8x^2 + 2x + 12x + 3$
 $8x^2 + 14x + 3$



Algebra Equations

An equation is a statement that two quantities are equal. $2 + 5 = 7$

An Algebraic equation may contain one or more letters in place of numbers. Each letter stands for a number whose value may not yet be known. $X + 20 = 30$



Practice Problems

1. $2x + 4 = 10$
2. $5y + 9 = -2y + 30$
3. $4z - (3z + 2) = 5$
4. $3x + \sqrt{2x^2 - 7} = 17$
5. $x^2 + 3x - 10 = 0$



Practice Problems

1. $2x + 4 = 10$

$$\begin{array}{r} -4 \quad -4 \\ \hline \end{array}$$

$$\frac{2x}{2} = \frac{6}{2}$$

$$x = 3$$

2. $5y + 9 = -2y + 30$

$$\begin{array}{r} +2y \quad +2y \\ \hline \end{array}$$

$$7y + 9 = 30$$

$$\begin{array}{r} -9 \quad -9 \\ \hline \end{array}$$

$$\frac{7y}{7} = \frac{21}{7}$$

$$\frac{7y}{7} = \frac{21}{7}$$

$$y = 3$$



Practice Problems

Back up plan!

1. $2x + 4 = 10$

a. 4

b. 0

c. 3

$$2(3) + 4 = 10$$

$$6 + 4 = 10$$

$$10 = 10$$

$$5y + 9 = -2y + 30$$

a. 1

b. -2

c. 3

$$5(3) + 9 = -2(3) + 30$$

$$15 + 9 = -6 + 30$$

$$24 = 24$$



Practice Problems

Back up plan!

1. $4z - (3z + 2) = 5$

a. $2/3$

b. 7

c. 1

$$4(7) - (3 \times 7 + 2) = 5$$

$$4(7) - (21 + 2) = 5$$

$$4(7) - 23 = 5$$

$$28 - 23 = 5$$

$$5 = 5$$



Practice Problems

Back up plan!

$$3x + \sqrt{2x^2 - 7} = 17$$

- a. 1 $3(3) + \sqrt{2(3)^2 - 7} = 17$
- b. 3 $3(3) + \sqrt{2(9) - 7} = 17$
- c. 4 $3(3) + \sqrt{18 - 7} = 17$
 $3(3) + \sqrt{11} = 17$

$$3(1) + \sqrt{2(1)^2 - 7} = 17$$

$$3(1) + \sqrt{2(1) - 7} = 17$$

$$3(1) + \sqrt{2 - 7} = 17$$

$$3(4) + \sqrt{2(4)^2 - 7} = 17$$

$$3(4) + \sqrt{2(16) - 7} = 17$$

$$3(4) + \sqrt{32 - 7} = 17$$

$$3(4) + \sqrt{25} = 17$$

$$3(4) + 5 = 17$$

$$12 + 5 = 17$$



Practice Problems

Back up plan!

$$X^2 + 3x - 10 = 0$$

- a. -2 and 5
- b. -5 and 2
- c. 5 and 10
- d. -1 and 10



Practice Problems

Back up plan!

$$x^2 + 3x - 10 = 0$$

- a. -2 and 5
- b. -5 and 2
- c. 5 and 10
- d. -1 and 10

$$x^2 + 3x - 10 = 0$$

$$(-2)^2 + 3(-2) - 10 = 0$$

$$4 + 3(-2) - 10 = 0$$

$$4 + -6 - 10 = 0$$

$$-2 - 10 = 0$$

$$-12 \neq 0$$

$$x^2 + 3x - 10 = 0$$

$$2^2 + 3(2) - 10 = 0$$

$$4 + 3(2) - 10 = 0$$

$$4 + 6 - 10 = 0$$

$$0 = 0$$

$$x^2 + 3x - 10 = 0$$

$$(-5)^2 + 3(-5) - 10 = 0$$

$$25 + -15 - 10 = 0$$

$$10 + -10 = 0$$

$$0 = 0$$



Probability Basics

The probability of a certain event is the ratio of a given favorable outcome to the total possible number of outcomes.

$$\text{Probability formula} = \frac{\text{favorable outcome}}{\text{total possible outcomes}}$$

$$\text{Probability formula with multiple events} = \frac{\text{favorable outcome}}{\text{total possible outcomes}} \times \frac{\text{favorable outcome}}{\text{total possible outcomes}}$$



Practice Problems

1. What is the probability of picking a red marble out of a bag of marbles containing 5 red marbles, 3 yellow marbles, and 4 blue marbles?
2. What is the probability of picking a red marble out of a bag of marbles containing 5 red marbles, 3 yellow marbles, and 4 blue marbles and then putting the marble back and picking a yellow marble out of the bag?
3. What is the probability of picking a red marble out of a bag of marbles containing 5 red marbles, 3 yellow marbles, and 4 blue marbles, keeping that marble and then picking a yellow marble out of the bag?



Practice Problems

What is the probability of picking a red marble out of a bag of marbles containing 5 red marbles, 3 yellow marbles, and 4 blue marbles?

$$\frac{\text{Favorable outcome}}{\text{Total possible outcomes}}$$

$$\frac{5}{12} = 0.417$$



Practice Problems

What is the probability of picking a red marble out of a bag of marbles containing 5 red marbles, 3 yellow marbles, and 4 blue marbles and then putting the marble back and picking a yellow marble out of the bag?

Probability formula with multiple events = $\frac{\text{favorable outcome}}{\text{total possible outcomes}} \times \frac{\text{favorable outcome}}{\text{total possible outcomes}}$

$$\frac{5}{12} \times \frac{3}{12} = \frac{15}{144} \text{ or } 0.104$$



Practice Problems

What is the probability of picking a red marble out of a bag of marbles containing 5 red marbles, 3 yellow marbles, and 4 blue marbles, keeping that marble and then picking a yellow marble out of the bag?

Probability formula
with multiple events = $\frac{\text{favorable outcome}}{\text{total possible outcomes}} \times \frac{\text{favorable outcome}}{\text{total possible outcomes}}$

$$\frac{5}{12} \times \frac{3}{11} = \frac{15}{132} \quad \text{or } 0.114$$



Practice Problems

A quarter, a nickel, and a dime are each tossed, in that order.

1. How many possible outcomes are there when flipping the three coins in order?
2. What is the probability that all three coins land on tails?



Practice Problems

A quarter, a nickel, and a dime are each tossed, in that order.

How many possible outcomes are there when flipping the three coins in order?

$$2 \times 2 \times 2 = 8$$



Practice Problems

A quarter, a nickel, and a dime are each tossed, in that order.

What is the probability that all three coins land on tails?

Probability formula
with multiple events = $\frac{\text{favorable outcome}}{\text{total possible outcomes}} \times \frac{\text{favorable outcome}}{\text{total possible outcomes}}$

$$\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} = \frac{1}{8} \text{ or } 0.125$$



Word Problem Basics

1. Read CAREFULLY.
2. Pay special attention to NEEDED details.
3. Pay attention to what is actually being asked.
4. On multi-step questions, make sure to do ALL steps.



Practice Problems

The set of problems gives the same information but asks different questions.

1. On a recent trip together, Nancy drove 70 miles, Dave drove 45 miles, and Louis drove 95 miles. How many more miles did Nancy drive than Dave?
2. On a recent trip together, Nancy drove 70 miles, Dave drove 45 miles, and Louis drove 95 miles. How many miles did the three drive in all?
3. On a recent trip together, Nancy drove 70 miles, Dave drove 45 miles, and Louis drove 95 miles. What was the average number of miles driven by the three?
4. On a recent trip together, Nancy drove 70 miles, Dave drove 45 miles, and Louis drove 95 miles. If their total trip was going to be 250 miles, how many more miles did they still have to go?



Practice Problems

1. On a recent trip together, Nancy drove 70 miles, Dave drove 45 miles, and Louis drove 95 miles. How many more miles did Nancy drive than Dave?

$$70 \text{ miles} - 45 \text{ miles} = \underline{25 \text{ more miles}}$$

2. On a recent trip together, Nancy drove 70 miles, Dave drove 45 miles, and Louis drove 95 miles. How many miles did the three drive in all?

$$70 \text{ miles} + 45 \text{ miles} + 95 \text{ miles} = \underline{210 \text{ miles in all}}$$



Practice Problems

3. On a recent trip together, Nancy drove 70 miles, Dave drove 45 miles, and Louis drove 95 miles. What was the average number of miles driven by the three?

$$\frac{70 \text{ miles} + 45 \text{ miles} + 95 \text{ miles}}{3 \text{ drivers}} = \underline{70 \text{ miles}}$$

4. On a recent trip together, Nancy drove 70 miles, Dave drove 45 miles, and Louis drove 95 miles. If their total trip was going to be 250 miles, how many more miles did they still have to go?

$$70 \text{ miles} + 45 \text{ miles} + 95 \text{ miles} = 210 \text{ total miles driven so far}$$

$$250 \text{ total trip miles} - 210 \text{ total driven miles} = \underline{40 \text{ miles remaining}}$$



Practice Problems

Star Fitness Gym charges a one time application fee of \$100. The gym also advertises a yearly membership for \$500 or \$50 per month. How much will it cost for someone to join for 6 months?

- a. \$300
- b. \$400
- c. \$800
- d. \$900



Practice Problems

Star Fitness Gym charges a one time application fee of \$100. The gym also advertises a yearly membership for \$500 or \$50 per month. How much will it cost for someone to join for 6 months?

- a. \$300 - This is the amount if you only multiply $\$50 \times 6$ months.
- b. \$400 - This is the amount if you multiplied $\$50 \times 6$ months and remembered to add the one time \$100 fee
- c. \$800 - This is the amount if you multiplied $\$50 \times 6$ months plus the \$500 yearly fee.
- d. \$900 - This is the same as C but also adding the \$100 application fee.

Calculator Basics and Fractions

1. A handheld calculator will be provided that can be used on the entire test.
2. Important features include $+$, $-$, $\frac{\square}{\square}$, \times , \pm , and $\sqrt{\square}$
3. When using a calculator, do the problem twice.
4. The negative sign is entered after the number.
5. A fraction must be converted into a decimal in order to enter the number into the calculator.
6. Keep your calculator in the F (floating) mode





Practice Problems

1. $6(5 - 8)$

2. $(-2)^2 - 5$

3. $4 - \frac{1}{5}(4)$

4. What is the Celsius temperature when the Fahrenheit temperature is 77? Formula: $\frac{5}{9}(F - 32) = C$



Practice Problems

1. $6(5 - 8) = 6(-3) = -18$

2. $(-2)^2 - 5 = 4 - 5 = -1$

3. $4 - \frac{1}{5}(4) = 4 - 0.8 = 3.2$

4. What is the Celsius temperature when the Fahrenheit temperature is 77? Formula: $\frac{5}{9}(F - 32) = C$

$$0.555556(77 - 32)$$

$0.55556(45) = 25.00002$ or approximately 25 degrees Celsius



Graphing Equations & Inequalities

Tips for the graphing questions:

1. Remember the equation of a line is $y = mx + b$, b is where the line crosses the y axis (y -intercept) and m is the slope (rise/run).
2. Slope always needs to be in fraction form. If it is a whole number, simply put a 1 as the denominator.
3. On multiple choice problems, always rule out the obvious wrong graphs first.
4. On inequality graphing questions, decide if the shading should be above or below the line.



Practice Problems

- See graphing handout



Angle and Triangle Basics

Angle reminders:

1. Right angle = 90 degrees
2. Complementary angle = 90 degrees
3. Supplementary angle = 180 degrees

Triangle reminders:

1. The sum of the interior angles of a triangle is 180 degrees.
2. Pythagorean Theorem is $a^2 + b^2 = c^2$ and is used to find the missing measurement of the side of a right triangle.



Practice Problems

- See angle/triangle handout



Geometry Review

Circles, Perimeter & Area

Geometry reminders:

1. Use your formula sheet even if you think you know the formula.
2. Diameter of a circle is the distance across a circle through the center.
3. Radius of a circle is the distance from the center of the circle to any point on the outer edge.
4. π is estimated to be 3.14
5. Perimeter is the distance around a 2-D shape.
6. Area is the space inside a 2-D shape.



Practice Problems

- See geometry handout



Last Minute Advice

1. Pay attention to the clock, but don't dwell on it. (easier said than done!)
2. Use the answers to help when you are stuck and do not know how to start.
3. The calculator is your friend.
4. Write down PEMDAS on your scrap paper as a reminder.
5. When blindly guessing, always guess the same letter.
6. When solving a word problem, make sure you have answered the question it was asking, and check to see if your answer makes sense.
7. Flag the questions that you want to go back to if you have extra time.



Resources

Books

New Readers Press: Mathematics for the HiSET Test

McGraw Hill: Contemporary's Number Power books 2 - 4

Kelley Wingate Publication: Algebra

Bittinger/Keedy: Essential Algebra with Problem Solving

Websites

[Mathantics.com](https://www.mathantics.com)

[Math-Dills.com](https://www.math-dills.com)

[mathworksheets4kids.com](https://www.mathworksheets4kids.com)