To:

FROM: Mrs. Jewell and Mrs. Rava

Attached you will find your summer packet. This packet is meant to help you refresh many of the math skills you will need to succeed in AP Calculus AB. **COMPLETED PACKETS ARE DUE THE FIRST DAY OF SCHOOL**. If you lose this copy, go to the Wakefield website for another copy.

AP Calculus will be taught as a flipped classroom. If there are any topics in this review packet that you do not recall, watch the recommended video **before** attempting the problems. **Unless otherwise stated, all questions should be done without a calculator!**

We will work some of these problems during SUMMER BRIDGE so we encourage you to attend AP Summer Bridge.

We are looking forward to a wonderful year with you! If you need to reach us over the summer, you can email us:

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Have a great summer!

**Please purchase a TI-84 Calculator is you do not already own one.**  The best sales are usually at the end of July.Topic 1: Area and Volume

Topic 1: Perimeter and Area

<https://www.youtube.com/watch?v=ZASBmoylCPc>

From memory, write the following geometrical formulas

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| --- | --- | --- | --- |
| Area of a Circle | Circumference of a Circle | Area of a Square | Area of a Rectangle |
| Area of a Trapezoid | Volume of a Sphere | Surface Area of a Sphere | Volume of a Cone |

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| Find the area of the shaded region. |  | Use a calculator. If the surface area of a sphere is 16, find the volume of the sphere. |

Topic 2: Slope of a Line

Rate and Slope: https://www.youtube.com/watch?v=izsiAR4p4jk

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| Find the slope of the line through (3, 4) through (-2. 5). | If 5 tickets to the movie cost $75 and 9 tickets cost $105, find the rate of change for movie tickets. Include the units of measure. |
| If f(x) = 2x2-x + 5, find the slope of the line connecting (0, f(0)) and (2, f(2)). | Find the slope of the line that is perpendicular to the one represents in this table.

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| --- | --- | --- | --- |
| x | -1 | 0 | 1 |
| f(x) | 15 | 10 | 5 |

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| Find the slope of the linear function, f(x) given that f(-2) = 4 and f(3) = -6 | Find the slope of the line: |

Topic 3: Writing Equations of Lines

In Calculus, we usually use the point-slope equation of a line, (y – y0) = m(x – x0), instead of the slope intercept equation, y = mx + b. If you are unfamiliar with the point-slope equation, you should watch this video:

<https://www.youtube.com/watch?v=vut5b2fRQQ0>

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| Find the equation of the line with a slope of 3 that passes through (-2. 5). | If f(x) is a linear, find the equation of the line that connects f(3) = -4 and f(0) = 1. |
| Find the equation of a line perpendicular to y = 2x + 1,through (2, 3). | Find the equation of the line that represents the values in the table:

|  |  |  |  |
| --- | --- | --- | --- |
| x | -1 | 1 | 3 |
| f(x) | 5 | 10 | 15 |

 |

 How to Use the Point Slope Form of a Line

 <https://www.youtube.com/watch?v=yAwHC3OyY7c>

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| If f(x) = (x – 4)2 + 1, find the line that connects the points (-1, f(-1)) to (3, f(3)) | Find the equation of a line in point-slope form |

Topic 4: Exact Values for Trigonometric Functions

Determine Trigonometric Function Values Using the Unit Circle

 <https://www.youtube.com/watch?v=i56P6xzsB5Y>

Draw a picture of the unit circle Draw a picture of the special right triangles

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Topic 5: Trigonometric Identities

Fundamental Trigonometric Identities: <https://www.youtube.com/watch?v=OmJ5fxyXrfg>

Double Angle Identities: <https://www.youtube.com/watch?v=-zhCYiHcVIE>

Example: Simplifying an expression using sum and difference identities: <https://www.youtube.com/watch?v=HKtWTPR_Fxg>

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| Write the 3 Pythagorean Identities | Cos 2A =  |
| Cos (A + B) =  |  |

|  |  |
| --- | --- |
| Write the three Pythagorean Identities |  |

Topic 6: Inverse Trigonometric Functions

Introduction in Inverse sine, cosine and tangent functions: <https://www.youtube.com/watch?v=LUpa5nPskAc>

Examples: <https://www.youtube.com/watch?v=7Wd64tsv-O8>

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|  | Y = Arcsin(x)y = sin-1(x) | Y = Arccos(x)y = cos-1(x) | Y = Arctan(x)y = tan-1(x) |
| Range |  |  |  |
| Quadrant Restrictions |  |  |  |

Find the exact value.

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| --- | --- | --- | --- |
|  | = |  |  |

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| --- | --- | --- | --- |
| = | = | = | = |
| = | = |  |  |

Topic 7: Exponential and Logarithmic Expressions

<https://www.youtube.com/watch?v=SxF44olWTyk>

<https://www.youtube.com/watch?v=L5Z_3RrrVjA&feature=youtu.be>

<https://www.youtube.com/watch?v=vINRIRgeKqU&feature=youtu.be>

Evaluate

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|  | = | = |
|  |  | = |

Simplify:

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Topic 8: Properties of logarithms

<https://www.youtube.com/watch?v=bzV3lbfNhn8&feature=youtu.be>

Rewrite the expression as a single log – *use the product, quotient, and power properties of logs*

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Topic 9: Graphs Parent Functions

There are no videos for this section. You may use the internet for help.

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| Quadratics: Domain: Range: | Exponential Function: Domain: Range: |
| Logarithmic Functions: Domain: Range: | Square Root Functions: Domain: Range: |
| Sine Function: y = 3sin x | Cosine Function: y = 3cos x |
| Tangent functions: y = tan x | Rational Function: Domain: Range: |

Topic 10: Factoring

<https://www.youtube.com/watch?v=v20tk0oS9NE&feature=youtu.be>

<https://www.youtube.com/watch?v=5KyxD6qg3g8>

Simplify:

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Topic 11: Sigma Notation

<https://www.youtube.com/watch?v=0L0rU17hHuM&feature=youtu.be>

11.1 Pre-test

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Topic 12: Long Division

Watch the following video on long division: <https://www.youtube.com/watch?v=brpNxPAkv1c>

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Topic 13: Solving Equations There are no videos for this section.

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| 6x – 3x2 = 0 |  |  |
| e sin(x) cos(x) = 0 |  |  |
| Hint: Look for a trig. identity |  | Hint: let  |

Topic 14: Solving Systems

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| x + y = 52x – y = 1 |  |
|  | Use a calculator and round to 3 decimal places. |