

Middle College High School Summer 2020 Algebra 2 Packet Math

Have the packet completed by 1st Day of school and ready to turn.

For each situation create a function or equation.

1. A high school graduate can make \$20,000 per year. Any additional year of training or schooling can increase the salary by \$3,000 per year. Create an equation to represent this situation.

2. The Pink Palace Museum had 250,000 visitors in 2015. The number of visitors has decreased by 2.5% each year since then. Write a function $v(t)$ to represent the number of visitors to the museum t years after 2015.

3. Joe bought 5 small tapas dishes and 4 large ones on a visit to a restaurant and spent \$26. He went back another day and got 4 small dishes and one big one for \$20. Write a system of equations to represent the cost of a small tapas dish, s , and the cost of a large tapas dish, l .

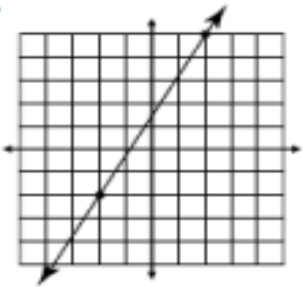
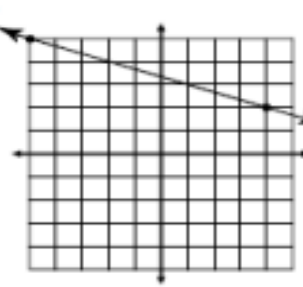
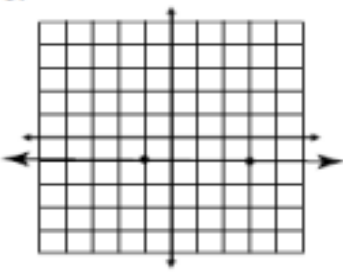
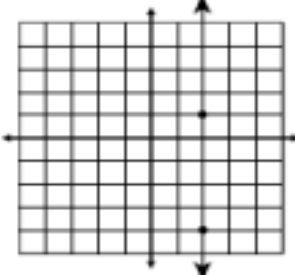
4. Kendrick deposits twice as much money into his account as he did the day before. His initial deposit is \$5. Write an equation to model his daily deposit, y , x days after his initial deposit.

5. A regular work week is 40 hours. Overtime pay is time and $\frac{1}{2}$ times your hourly wage. Martha makes \$12 per hour, at the Ketchup Factory. Create an equation to represent this situation.

6. The length of a rectangle is 2 less than three times the width. Write an equation that you could use to find the dimensions of the rectangle if the area is 65 square meters.

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Directions: Find the slope between each pair of points.	
1. (1, 1) and (4, 3)	2. (-2, 4) and (10, -2)
3. (-4, 5) and (-8, -5)	4. (10, 0) and (-2, 4)

Directions: Find the slope of each line. Write your answer in simplest form!	
1. 	2. 
3. 	4. 

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Rewrite the following functions in vertex form.

1) $f(x) = x^2 + 10x + 31$

2) $f(x) = x^2 - 12x + 26$

3) $f(x) = 2x^2 + 12x + 7$

4) $f(x) = -3x^2 + 24x - 5$

Solve the following equations.

5) $(x - 5)^2 = 49$

6) $(x + 3)^2 + 5 = 30$

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Solve each equation.

1. $x^2 + 5x + 6 = 0$

2. $x^2 - 7x - 18 = 0$

3. $x^2 - 4 = 0$

4. $x^2 + 8x - 20 = 0$

5. $x^2 + 14x + 13 = 0$

6. $x^2 - 3x - 10 = 0$

7. $x^2 + 7x = 8$

8. $x^2 = 25$

9. $x^2 + 10x = -21$

10. $x^2 = -6x + 72$

11. $2x^2 + 16 + 32 = 0$

12. $10x^2 - 160 = 0$

14. $9x^2 - 25 = 0$

15. $3x^2 + 12x - 36 = 0$

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From the reference sheet:

Arithmetic Sequence: $a_n = a_1 + (n - 1)d$

Geometric Sequence: $a_n = a_1(r)^{n-1}$

Finite Geometric Series: $S_n = \frac{a_1(1-r^n)}{1-r}$

Write an explicit formula for each of the following sequences.

1) 3, 15, 75, 375, 1875, ...

2) -405, 135, -45, 15, -5, ...

3) -3, -6, -12, -24, -48, ...

4) $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}, \frac{1}{32}, \dots$

5) -1, -31, -61, -91, ...

6) 9, -191, -391, -591, ...

7) -12, -18, -24, -30, ...

8) 35, 25, 15, 5, ...

9) -1, -5, -25, -125, ...

10) -4, 16, -64, 256, ...

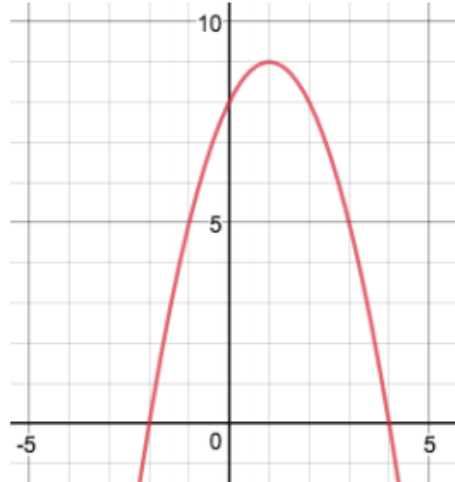
11) 2, 6, 18, 54, ...

12) 2, 4, 8, 16, ...

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Identify the features of each function.

- 1) Axis of Symmetry: _____
- 2) Vertex: _____
- 3) Max or Min: _____
- 4) Y-intercept: _____
- 5) X-intercepts: _____
- 6) Increasing Interval: _____
- 7) Decreasing Interval: _____
- 8) End Behavior: _____
- 9) Positive Interval: _____
- 10) Negative Intervals: _____



$$f(x) = x^2 + 12x + 20$$

- 1) Axis of Symmetry: _____
- 2) Vertex: _____
- 3) Max or Min: _____
- 4) Y-intercept: _____
- 5) X-intercepts: _____
- 6) Increasing Interval: _____
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- 8) End Behavior: _____
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Algebra 2 EOC Practice Problems

Algebra II, Subpart 1



Calculator Prohibited

1 Simplify the expression $(2 - 3i)(4 + 2i)$.

- A. 14
- B. $6i$
- C. $2 - 8i$
- D. $14 - 8i$

2 Fannie is making a rectangular blanket. The length of the blanket is 10 inches greater than its width, w , in inches.

Write the function, $f(w)$, that describes the area, in square inches, of Fannie's blanket as a function of the width, w .

Enter your answer in the space provided.

3 What is the remainder when $f(x) = x^3 + 3x^2 - 10x - 14$ is divided by $(x - 3)$?

Enter your answer in the space provided.

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Calculator Prohibited



Algebra II, Subpart 1

4 Which expression is equivalent to $(4x + 6y)^2$?

- M. $16x^2 + 36y^2$
- P. $4x^2 + 2(4x)(6y) + 6y^2$
- R. $(4x)^2 + 2(4x)(6y) + (6y)^2$
- S. $(4x)^2 + (4x)(6y) + (6y)^2$

5 Which expression is the correct factorization of $x^6 - y^6$?

- A. $(x + y)^3(x - y)^3$
- B. $(x^2 - y^2)(x^4 + 2xy + y^4)$
- C. $(x - y)(x + y)(x^2 + xy + y^2)(x^2 - xy + y^2)$
- D. $(x - y)(x^2 + 2xy + y^2)(x + y)(x^2 - 2xy + y^2)$

6 What value of x makes the equation $\frac{3}{x+3} = \frac{9}{x^2-9}$ true?

Enter your answer in the space provided.

Algebra II, Subpart 1



Calculator Prohibited

7 Jamie deposits \$627 into a savings account. The account has an interest rate of 3.5%, compounded quarterly.

Write the function that gives the amount of money in dollars, $J(t)$, in Jamie's account t years after the initial deposit.

Enter your answer in the space provided.

8 Which expression is equivalent to $\sqrt{16a^4x^6}$, when $a > 0$ and $x > 0$?

- M. $4a^2x^3$
- P. $4a^2x^4$
- R. $8a^2x^3$
- S. $8a^2x^4$