

POSNACK

S C H O O L

College Algebra Summer Assignment

Dear Parents/Students,

In the summertime, many necessary mathematical skills are lost due to the absence of daily exposure. The loss of skills may result in a lack of success and unnecessary frustration for students as they begin the new school year. The purpose of this math assignment is to set the stage for instruction for the new school year. Packets can be printed out or can be printed to OneNote. The completed packet is due on the first day of school during math class and will be worth 30 homework points. The packet is a review of previously taught concepts. If needed, additional help can be found at www.khanacademy.org. These skills are required to be successful in the upcoming year.

Thank you,

Fischer High School Math Team

1) Distribute.

$$(2x - 3)(x^2 + 3x - 7)$$

2) Factor completely.

$$6x^3 + 21x^2 + 18x$$

3) Evaluate the expression.

$$3a^2b - 4c + ab^2 \text{ if } a = -4, b = 2, c = -2$$

4) Solve for x.

$$-16 + 5x = -7(-6 + 8n) + 3$$

5) Solve for x.

$$2 - 5|5x - 5| = -73$$

6) Evaluate.

$$|2x - 4y| + 10 ; x = 6, y = -3$$

7) Solve for D:

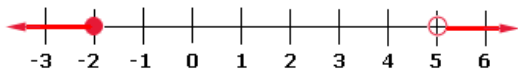
$$3AY + \frac{1}{2}CD = G$$

8) Evaluate.

$$|2(-3)^2 + 4| - 10$$

Write the following intervals in set-builder notation and interval notation.

9)



10)



11)



12)



Solve the following linear inequalities. Provide your answer in either set-builder or interval notation. Provide a graph of your final answer.

13) $-3 - 6(4x + 6) > -111$

14) $6 - 4(6n + 7) \geq 122$

15) $9 \geq -2m + 2 - 3$

16) $-5n - 6n \leq 8 - 8n - n$

Solve the following absolute value inequalities. Provide your answer in either set-builder or interval notation. Provide a graph of your final answer.

| | |
|----------------------|-----------------------------|
| 17) $ -8a - 3 > 11$ | 18) $4 6 - 2a + 8 \leq 24$ |
|----------------------|-----------------------------|

Solve the following compound inequalities. Provide your answer in either set-builder or interval notation. Provide a graph of your final answer.

| | |
|-----------------------------------|--------------------------|
| 19) $n + 1 \leq -3$ or $-4n < -8$ | 20) $6 < 2x + 6 \leq 12$ |
|-----------------------------------|--------------------------|

Evaluate the following functions for the given values.

$$f(x) = 2x^3 - 10$$

$$g(x) = -3x^2 - 5$$

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|----------------|---------------|
| 21) $f(-2a) =$ | 22) $g(-3) =$ |
|----------------|---------------|

Write the following equations.

| | |
|--|---|
| <p>23) A line going through points $(-2,10)$ and $(-5,19)$ in point-slope form.</p> | <p>24) A line going through point $(-5,5)$ with a slope of $\frac{1}{2}$ in slope intercept form.</p> |
| <p>25) $\frac{2}{3}y - 10 = \frac{1}{2}x$ in standard form.</p> | <p>26) A line going through point $(2,6)$ with a slope of -2 in function notation.</p> |
| <p>27) Write a line perpendicular to $-2x + y = 5$ through the point $(-2, -3)$ in any form.</p> | <p>28) Write a line perpendicular to $6x + 2y = 7$ through the point $(-4,3)$ in any form.</p> |

Solve the system of equations by substitution or elimination.

29) $4x + 3y = -8$
 $y = 8x - 12$

30) $10x - 8y = 4$
 $-5x + 3y = -9$

31) $2x - 3y = -2$
 $4x + y = 24$

32) $-5x + 7y = 28$
 $x + 7y = -14$

Solve each word problem using a system of equations.

33) The senior classes at planned two trips to the state fair. The first trip filled 10 vans and 6 buses with 276 students. The second trip filled 5 vans and 2 buses with 117 students. How many students can a van carry? How many students can a bus carry?

34) The sum of three numbers is 15. The second number is 1 more than the first number. The sum of the first and third numbers is equal to twice the second number. Find all three numbers.

Solve the system of equations.

$$\begin{aligned} 35) \quad & 2x - y + z = 4 \\ & x + 3y - z = 11 \\ & 4x + y - z = 14 \end{aligned}$$

Solve by factoring.

$$36) \quad 3x^2 + 7x = -2$$

$$37) \quad 121x^2 - 100 = 0$$

Solve for x using the square root property.

$$38) \quad 6x^2 + 102 = 0$$

$$39) \quad 15x^2 + 420 = 0$$

Find quadratic equation from two given solutions.

$$40) \quad x = 4, -2$$

$$41) \quad x = \frac{3}{4}, -3$$

Simplify complex square roots.

| | |
|-------------------------|----------------------|
| 42) $\sqrt{-216x^4y^5}$ | 43) $\sqrt{-484x^8}$ |
|-------------------------|----------------------|

Simply i to a power

| | |
|-----------------|-----------------|
| 44) $i^{117} =$ | 45) $i^{228} =$ |
|-----------------|-----------------|

Simplify complex numbers.

| | |
|-------------------------|------------------------------|
| 46) $6i - 2 + 3i - 15i$ | 47) $(15 + 4i) - (-4 + 12i)$ |
| 48) $4i^2(2 + 6i)$ | 49) $(-3 + 5i)(9 - 2i)$ |
| 50) $\frac{2i}{-2+3i}$ | 51) $\frac{1+i}{2i}$ |

Solve using the quadratic formula:

- a) Find the discriminant
- b) State the number and type of solutions
- c) Solve for x (make sure you simplify!)

| | |
|----------------------------|----------------|
| 52) $-2x^2 - 8x - 14 = -6$ | 53) $x^2 = 5x$ |
|----------------------------|----------------|

Find the following information from the quadratic.

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| 54) $y = 4x^2 - 8x + 2$ Axis of Symmetry: Domain: Range: Vertex: Minimum or maximum value: |
|---|

State all the transformations.

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| 55) $y = -\frac{1}{4}(x - 5)^2 - 10$ a. Reflection: b. Dilation: c. Horizontal translation: d. Vertical translation: |
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Simplify.

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| 56) $(5x^2y^3)^2(3x^0y^2)^2$ | 57) $\frac{3a^6b^7}{12ab^9}$ |
| 58) $(2x^5 + 2x^2)(x^4 - x^2 + 2)$. | 59) $(2x^2 - 6x + 7)$ $-(3x^3 + 7x^2 + 8x - 2)$ |

| | |
|---|--|
| 60) Simplify $(p^3 - 10p^2 + 20p + 26) \div (p - 5)$ using long division. | 61) Simplify using synthetic division $(x^4 + 9) \div (x - 3)$. |
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Find the following using these two functions:

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

$$g(x) = 2x + 3$$

$$h(x) = 2x^2$$

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| 62) $f + g(x) =$ | 63) $f - g(x) =$ |
|------------------|------------------|

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|------------------------|-----------------------|
| 64) $\frac{f}{g}(x) =$ | 65) $h \cdot g(x) =$ |
| 66) $f \circ h(x) =$ | 67) $h \circ f(-4) =$ |

Simplify the following radicals.

| | |
|---|--|
| 68) $\sqrt{54x^7y^5}$ | 69) $\sqrt[4]{32a^{28}b^{17}}$ |
| 70) $\sqrt[3]{128} \cdot \sqrt[3]{125t^6w^2}$ | 71) $-\sqrt{27} - 3\sqrt{45} - \sqrt{20} + 2\sqrt{45}$ |

$$72) \quad (4\sqrt{5} + \sqrt{2})(3\sqrt{5} - 2)$$

$$73) \quad \frac{-3}{4-\sqrt{3}}$$

Solve the following radical equations.

$$74) \quad \sqrt{x+2} + 4 = 7$$

$$75) \quad 2(6x - 3)^{\frac{1}{3}} - 4 = 0$$