Fraction Review

The following questions are to be done without a calculator. If you cannot perform these operations without a calculator, you will probably find this course difficult.

Greatest Common Factor (G.C.F.)

Ex: Find the G.C.F. of 28, 42 and 84.

2 | 28 42 84

7 | 14 21 42 no more common factors

2 3 6 ← between the three numbers

Therefore the G.C.F. is $2\times7 = \underline{14}$.

Practise Question 1: Find the G.C.F. of :

a) 24 and 64

b) 25, 30 and 45

c) 120, 300 and 440

Equivalent Fractions

Ex: $\frac{6}{8}=\frac{6\div2}{8\div2}=\frac{3}{4}$ $\frac{3}{4}=\frac{3\times9}{4\times9}=\frac{27}{36}$ $\frac{3}{4},\frac{6}{8}$ and $\frac{27}{36}$ are equivalent fractions.

Practice Question 2: Find 3 equivalent fractions of each of the following:

a) $\frac{1}{2}$ b) $\frac{12}{15}$ c) $\frac{9}{27}$

Fraction Reduction

Ex: Reduce $\frac{27}{36}$ to the lowest term.

Ans: The G.C.F. of 27 and 36 is 9. So, $\frac{27}{36}=\frac{27\div9}{36\div9}=\frac{3}{4}$

Practice Question 3: Reduce the following fractions to the lowest terms.

a) $\frac{64}{100}$ b) $\frac{154}{805}$ c) $\frac{92}{161}$

Lowest Common Multiple (L.C.M.)

Ex: Find the L.C.M. of 12 and 14.

2 | 12 14

6 7 ← no more common factors

Therefore the L.C.M. is $2\times6\times7 = \underline{84}$.

Practise Question 4: Find the L.C.M. of :

a) 8 and 10 (it's NOT 80!!!)

b) 12 and 18

c) 10, 14 and 35 (this is tricky!)

Fraction Addition and Subtraction

Ex 1: Evaluate $\frac{8}{9}+\frac{2}{3}$.

Ans: $\frac{8}{9}+\frac{2}{3}$

$=\frac{8}{9}+\frac{6}{9}$

$=\frac{14}{9}$ or $1\frac{5}{9}$ (but we will not be using mixed fractions in this course)

Ex 2: Evaluate $\frac{46}{17}-\frac{7}{20}$.

Ans: $\frac{46}{17}-\frac{7}{20}$

$=\frac{920}{340}-\frac{119}{340}$

$=\frac{801}{340}$ or $2\frac{121}{340}$ (but we will not be using mixed fractions in this course)

Practice Question 5: Evaluate the following fractions. Reduce your answers to lowest terms.

a) $\frac{3}{5}+\frac{1}{2}$ b) $\frac{4}{9}-\frac{1}{3}$ c) $\frac{1}{4}+\frac{3}{5}-\frac{3}{8}$

Fraction Multiplication and Division

Ex 1: Evaluate $\frac{8}{9}\times\frac{2}{3}$.

Ans: $\frac{8}{9}\times\frac{2}{3}$

$=\frac{16}{27}$

Ex 2: Evaluate $\frac{8}{9}\div\frac{2}{3}$.

Ans: $\frac{8}{9}\div\frac{2}{3}$

$=\frac{8}{9}\times\frac{3}{2}$

$=\frac{8\times3}{9\times2}$

$=\frac{4}{3}$

Practice Question 6: Evaluate the following fractions. Reduce your answers to lowest terms.

a) $\frac{3}{5}\times\frac{1}{2}$ b) $\frac{6}{5}\times\frac{3}{10}$ c) $\frac{5}{12}\div\frac{3}{8}$ d) $\frac{12}{17}\div\frac{20}{17}\times\frac{4}{9}$

Order of Operation with Fractions (BEDMAS)

Ex: Evaluate $\frac{7}{10}+\frac{5}{11}\times\frac{22}{40}-\left(\frac{1}{16}+\frac{3}{20}\right)$

Ans: $\frac{7}{10}+\frac{5}{11}\times\frac{22}{40}-\left(\frac{1}{16}+\frac{3}{20}\right)$

$=\frac{7}{10}+\frac{5\times22}{11\times40}-\left(\frac{5}{80}+\frac{12}{80}\right)$

$=\frac{7}{10}+\frac{2}{8}-\left(\frac{17}{80}\right)$

$=\frac{56}{80}+\frac{20}{80}-\frac{17}{80}$

$=\frac{56+20-17}{80}$

$=\frac{76-17}{80}$

$=\frac{59}{80}$

Practice Question 7: Evaluate the following fractions. Reduce your answers to lowest terms.

a) $\frac{20}{21}\div\frac{2}{3}-\frac{1}{3}$ b) $4-\frac{5}{6}\times\frac{3}{4}+\frac{1}{2}$

c) $\left(\frac{1}{3}\right)^2\div\frac{16}{27}+\frac{1}{6}\times2$ d) $\frac{1}{2}\times\left(\frac{2}{3}+\frac{1}{6}\right)$

e) $\frac{1}{5}-\frac{2}{3}\div\frac{10}{9}$ f) $\frac{6}{7}-\frac{2}{5}+\frac{8}{15}$

g) $\frac{6}{7}\times\frac{2}{5}\div\frac{8}{15}$ h) $\frac{6}{7}-\left(\frac{2}{5}+\frac{8}{15}\right)$

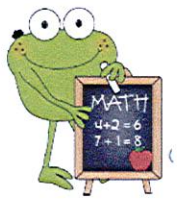
i) $\frac{6}{7}\times\left(\frac{2}{5}\div\frac{8}{15}\right)$ j) $\left(\frac{97}{16}-5\right)\div\frac{17}{4}$

Answers: 1a) 8 b) 5 c) 20 | 2a) $\frac{2}{4},\frac{3}{6},\frac{4}{8},\ldots$ b) $\frac{4}{5},\frac{8}{10},\frac{16}{20},\ldots$ c) $\frac{1}{3},\frac{2}{6},\frac{3}{9},\ldots$ | 3a) $\frac{16}{25}$ b) $\frac{22}{115}$ c) $\frac{4}{7}$ | 4a) 40 b) 36 c) 70

5a) $\frac{11}{10}$ b) $\frac{1}{9}$ c) $\frac{19}{40}$ | 6a) $\frac{3}{10}$ b) $\frac{9}{25}$ c) $\frac{10}{9}$ d) $\frac{4}{15}$ | 7a) $\frac{23}{21}$ b) $\frac{31}{8}$ c) $\frac{25}{48}$ d) $\frac{5}{12}$ e) $-\frac{2}{5}$ f) $\frac{104}{105}$ g) $\frac{9}{14}$ h) $-\frac{8}{105}$ i) $\frac{9}{14}$ j) $\frac{1}{4}$

FRACTION REVIEW WITH QR CODES
DO NOT USE A CALCULATOR

THESE SKILLS WILL BE ESSENTIAL IN MANY THINGS WE DO!

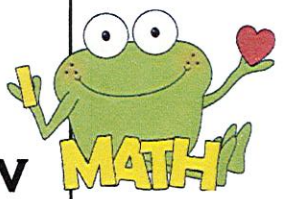


WITH YOUR WORK, write down an explanation where "simple" answers come from.

1. $\frac{1}{5} = \frac{7}{?}$	2. $\frac{3}{10} = \frac{24}{?}$	3. $\frac{3}{?} = \frac{6}{8}$	4. $\frac{9}{24} = \frac{?}{8}$
5. $\frac{10}{15} = \frac{?}{21}$	6. $\frac{6}{16} = \frac{9}{?}$	7. $\frac{9}{54} = \frac{5}{?}$	8. $\frac{18}{81} = \frac{?}{18}$
9. $2\frac{1}{3} + 1\frac{3}{4}$	10. $\frac{5}{6} - \frac{1}{4}$	11. $\frac{3}{8} + \frac{7}{10}$	12. $\frac{7}{9} - \frac{1}{3}$
13. $19\frac{1}{6} - 12\frac{11}{12}$	14. $1\frac{1}{6} + 1\frac{5}{6}$	15. $\frac{5}{8} + \frac{2}{3}$	16. $7\frac{1}{2} - 4\frac{2}{3}$
17. $\frac{2}{3} \cdot 12\frac{3}{4}$	18. $\frac{3}{4} \cdot \frac{1}{2}$	19. $\frac{3}{6} \cdot 18$	20. $\frac{1}{2} \cdot 1\frac{1}{2}$
21. $\frac{3}{4} \cdot \frac{1}{6}$	22. $7 \cdot 3\frac{7}{10}$	23. $\frac{1}{4} \cdot 12$	24. $\frac{7}{10} \cdot \frac{2}{3}$
25. $\frac{1}{4} \div 3$	26. $\frac{1}{2} \div 4$	27. $4 \div 3$	28. $3 \div \frac{1}{4}$
29. $4 \div 12$	30. $\frac{1}{5} \div 10$	31. $6 \div \frac{1}{3}$	32. $\frac{1}{2} \div 8$

1.	2.	3.	4.	5.	6.	7
8.	9.	10.	11.	12.	13.	14.
15.	16.	17.	18.	19.	20.	21.
22.	23.	24.	25.	26.	27.	28.
29.	30.	31.	32.			

QR Code Answer Sheet Fraction Review



Polynomial Review #1

Addition	Subtraction
1. $(7x - 5 + 8x^2) + (3x^2 + 2 - 9x)$	1. $(-3 - 5x^2 + 2x) - (-7 + x^2 + 2x)$
2. $-(x^2 - 3x + 18) + (x^2 - 3x + 15)$	2. $(x^2 + 8) - (-9x^2 + 3x + 2)$
3. $(-4x^2 + x) + (-9 + x^2 - 6x)$	3. $(x^2 - 4x + 1) - (6x^2 - 8x + 5)$
4. $(4x^3 - 4x^2 + x) + (x^3 + x^2 + 7x)$	4. $(3x^2 + 7x) - (4x^2 - x - 2)$
5. $(4x - 5y) + (4x + 5y)$	5. $(6c^2 + 4c) - (c^2 - 18)$

Multiplication	Multiplication
1. $-8(x^2 - 3x + 1)$	6. $(9x^2 + 2)(5x^2 - 6)$
2. $3x(4x^2 + 6x - 9)$	7. $(7 - 2y)(9 + y)$
3. $-4c(c^2 - 18)$	8. $(4x - 5y)(4x + 5y)$
4. $(x + 8)(x^2 - 5x + 11)$	9. $(12x + 10)^2$
5. $(4x + 1)(3x - 2)$	10. $(3x - 2)^3$

Factoring	Factoring
1. $5x + 15$	9. $x^2 + 73x + 72$
2. $4x^3 - 36x^2 + 12x$	10. $x^2 - 18x + 72$
3. $2x(x + 1) - 4(x + 1)$	11. $x^2 - 64$
4. $36x^2y - 45xy + 63xy^2$	12. $9x^2 - 1$
5. $x^2 + 9x + 14$	13. $6x^2 + 5x + 1$
6. $x^2 - 7x + 10$	14. $9x^2 - 24x + 16$
7. $x^2 - x - 12$	15. $x^3 - 8$
8. $x^2 + 6x - 27$	16. $27x^3 + 64$

A

- ❑ $2^6 \cdot 2^{-4}$
- ❑ $3r \cdot r^4$
- ❑ $(x^5y^2)(x^{-6}y)$

B

- ❑ $\left(\frac{4}{5}\right)^3$
- ❑ $\left(\frac{3}{5}\right)^{-2}$
- ❑ $\left(\frac{4}{x^2}\right)^3$

C

- ❑ $(d^5)^2$
- ❑ $(2^2)^3$
- ❑ $(h^5)^3h^4$

D

- ❑ $(1.02)^0$
- ❑ $(-2)^0$
- ❑ -5^0

E

- ❑ $(5y)^3$
- ❑ $(6x^2)^2$
- ❑ $(2y^{-4})^{-3}$

G

- ❑ $\frac{a^{11}}{a^4}$
- ❑ $\frac{4^7}{4^4}$
- ❑ $\frac{a^4b^2}{a^2b^5}$

F

- ❑ 4^{-3}
- ❑ $7s^{-4}t^2$
- ❑ $\frac{1}{r^{-4}s^2}$

Property Name	Algebraic Rule: For every nonzero number a and b and **integers** m and n, . . .	Description in Your Own Words	Which set of examples match this property? (Circle One)
Zero Product	$a^0 = 1$		A B C D E F G H
Negative Exponent	$a^{-n} = \frac{1}{a^n}$		A B C D E F G H
Product of Powers	$a^m \cdot a^n = a^{m+n}$		A B C D E F G H
Power of a Power	$(a^m)^n = a^{m \cdot n}$		A B C D E F G H
Power of a Product	$(a \cdot b)^n = a^n b^n$		A B C D E F G H
Quotient of Powers	$\frac{a^m}{a^n} = a^{m-n}$		A B C D E F G H
Power of a Quotient	$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$		A B C D E F G H

I ♡ Exponents!

Directions: *Simplify each expression. Identify matching answers between Column 1 and Column 2, then color the heart accordingly.*

Column 1

1. $2x^5y \cdot 3x^2y$ _____

2. $(4x^4y)^2 \cdot 2x^3y^4$ _____

3. $\dfrac{36x^9y^4}{4x^7y^3}$ _____

4. $\dfrac{(2xy^5)^3}{2x^3y^8}$ _____

5. $(-5x^6y^2)^2 - 12x^{12}y^4$ _____

6. $\dfrac{6x^{10}y^4}{3x^8y^7}$ _____

7. $6x^{-1}y^5 \cdot 4x^{-4}y^{-2}$ _____

8. $(3x^{-6}y^2)^3 \cdot 2x^{10}y^{-7}$ _____

9. $\dfrac{(-2xy)^2 \cdot 10x^3y^{11}}{8x^{10}y^4}$ _____

10. $\dfrac{8x^3 \cdot 12xy^7}{3x^2y^4} - 15x^2y^3$ _____

Column 2

Red: $x^4y^8 \cdot 5x^{-9}y$ _____

Orange: $\dfrac{(6x^2y^3)^2}{4x^2y^5}$ _____

Yellow: $(3x^{-3}y)^3 \cdot 2xy^{-4}$ _____

Light Green: $\dfrac{(3x^5y^5)^3}{3x^3y^{11}} + 4x^{12}y^4$ _____

Dark Green: $\dfrac{34x^{10}y^9}{2x^8y^6}$ _____

Light Blue: $\dfrac{42x^9y^5}{7x^2y^3}$ _____

Dark Blue: $3x^{-4}y^9 \cdot 8x^{-1}y^{-6}$ _____

Purple: $(2x^{-2}y^3)^4 \cdot 2x^{19}y^{-6}$ _____

Pink: $\dfrac{(-8x^3y^2)^2 \cdot 2x^2y^6}{32x^8y^3}$ _____

Brown: $\dfrac{3x^3y^4 \cdot 6xy^{-5}}{(3xy)^2}$ _____

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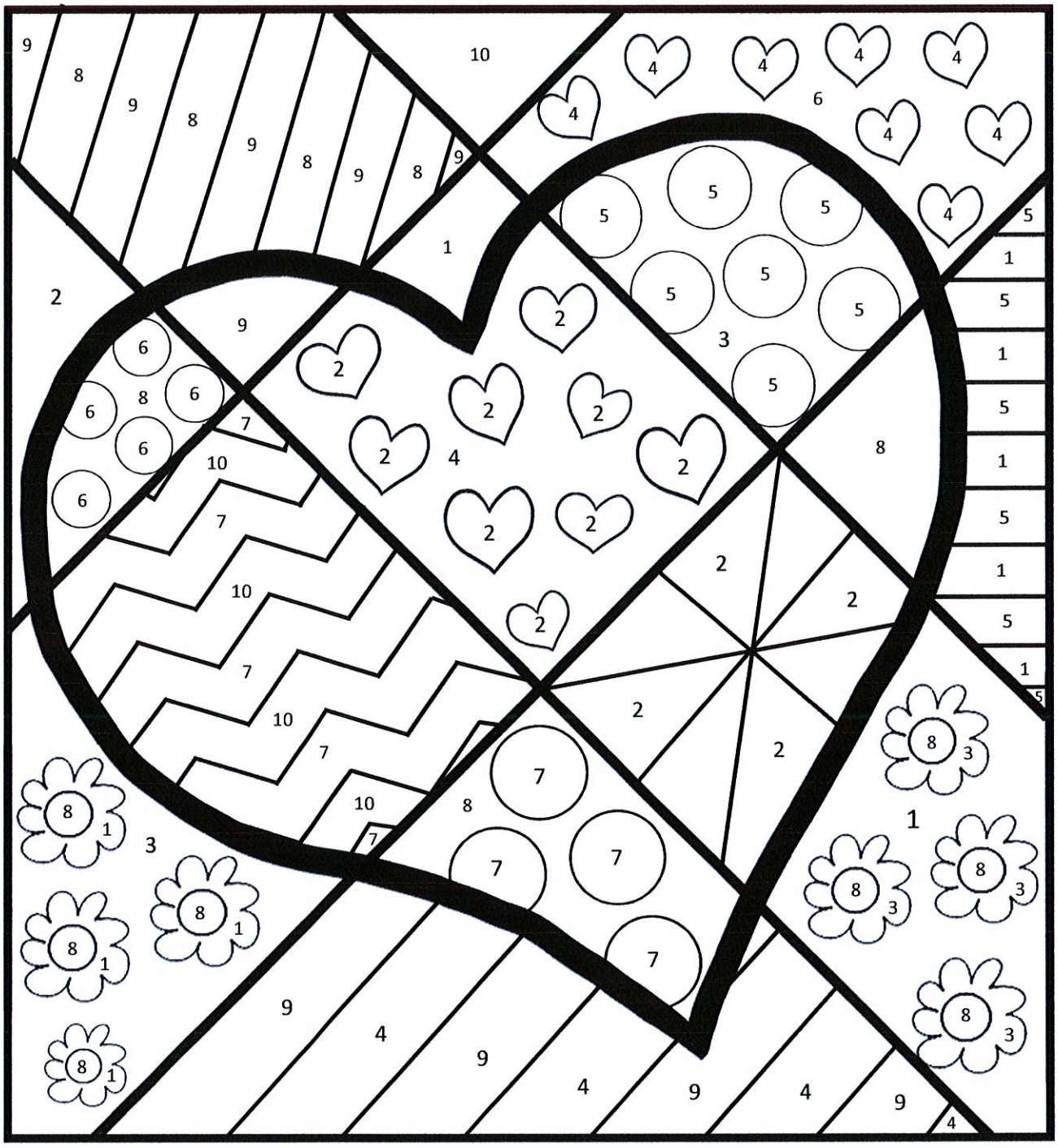

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Name: _____ Hour: _____

Coordinate Midpoint and Distance Review

Midpoints on the Coordinate Plane

- On the coordinate plane you need to have two different points, each having an x-value and a y-value, written in the form (x, y)
- The coordinates of the midpoint of a segment whose endpoints have coordinates (_____ , _____) and (_____ , _____) is given by:

$$m = \left(\frac{\quad + \quad}{2} , \frac{\quad + \quad}{2} \right)$$

Example: Find the midpoint of the segment between (-6, 7) and (4, 9)

Step one: Label your points (x_1, y_1) and (x_2, y_2)

$x_1 =$ _____, $y_1 =$ _____, $x_2 =$ _____, $y_2 =$ _____

Step Two: Substitute into the formula $m = \left(\frac{x_1 + x_2}{2} , \frac{y_1 + y_2}{2} \right)$

$m = \left(\frac{\quad + \quad}{2} , \frac{\quad + \quad}{2} \right)$

Step Three: Carry out the addition

$m = \left(\frac{\quad}{2} , \frac{\quad}{2} \right)$

Step Four: Divide and write the answer as a coordinate

m = (_____ , _____)

Try These: Find the midpoint between each pair of points.

1. (-12, 0) , (0, - 11)
2. (19, - 4) , (-8, 17)
3. (-8, -8) , (10, - 10)
4. (16, 15) , (5, - 2)
5. (24, 1) , (-3, 22)
6. (-12, 14) , (6, - 10)

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Distance on the Coordinate Plane

- On the coordinate plane you need to have two different points, each having an x-value and a y-value, written in the form (x, y)
- The distance d between two points with coordinates (_____ , _____) and (_____ , _____) is given by:

$$d = \sqrt{(_____ - _____)^2 + (_____ - _____)^2}$$

Example: Find the distance between (-6, 7) and (4, 9)

Step one: Label your points (x_1, y_1) and (x_2, y_2)

$x_1 =$ _____, $y_1 =$ _____, $x_2 =$ _____, $y_2 =$ _____

Step Two: Substitute into the formula $d = \sqrt{(y_2 - y_1)^2 + (x_2 - x_1)^2}$

$d = \sqrt{(_____ - _____)^2 + (_____ - (_____))^2}$

Step Three: Simplify the ( )

$d = \sqrt{(_____)^2 + (_____)^2}$

Step Four: Square the numbers inside of the ( ) and add

$d = \sqrt{_____ + _____}$

$d = \sqrt{_____}$

Step Five: Take the square root

$d = \sqrt{_____} \approx$ _____

Try These: Find the distance between each pair of points.

1. (-12, 0) , (0, - 11)
2. (19, - 4) , (-8, 17)
3. (-8, -8) , (10, - 10)
4. (16, 15) , (5, - 2)
5. (24, 1) , (-3, 22)
6. (-12, 14) , (6, - 10)

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WRITING EQUATIONS OF LINES PRACTICE

Math Joke of the Day: "Why do plants hate math? Because it gives them square roots."

I. Write the equation of the line that has the given slope and goes through the given point.

1. m = 2, (3, -2) _____

2. $m = \frac{1}{3}$, (0, 4) _____

3. $m = \frac{2}{5}$, (5, -1) _____

II. Write the equation of the line that goes through the two points. Leave your answer in slope intercept form.

4. (6, 2) (3, -1) _____

5. (-4, 5) (8, 7) _____

6. (0, -3) (4, -3) _____

III. Change the equation to standard form.

7. $y = \frac{5}{2}x - 3$ _____

8. $y = \frac{4}{3}x + 5$ _____

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WRITING EQUATIONS OF LINES PRACTICE

IV. Horizontal and Vertical Lines

9. Write the equation of the horizontal line that goes through the point (2, -4).

_____

10. Write the equation of the vertical line that goes through the point (-1, 3).

_____

V. Parallel and Perpendicular

11. Write the equation of the line parallel to y = 3x - 5 that goes through the point (2, -1).

_____

12. Write the equation of the line perpendicular to y = -2x + 1 through the point (-4, 2)

_____

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