G. Fraction Operations

1. Complete the operations indicated.

a. $\frac{5}{8}+\frac{2}{5}-\frac{1}{2}$

$\frac{25}{40}+\frac{16}{40}-\frac{20}{40}$

$\boxed{\frac{21}{40}}$

b. $2\frac{2}{3}-\frac{1}{4}$

$\frac{8}{3}-\frac{1}{4}$

$\frac{32}{12}-\frac{3}{12}$

$\boxed{\frac{29}{12}}$

c. $\frac{3}{8}\cdot\frac{7}{9}\cdot\frac{1}{2}=\frac{21}{144}=\boxed{\frac{7}{48}}$

d. $8\frac{1}{3}\cdot\frac{2}{3}$

$\frac{25}{3}\cdot\frac{2}{3}=\boxed{\frac{50}{9}}$

e. $\dfrac{\frac{1}{8}\div 4}{\frac{3}{2}}$

$\frac{1}{8}\cdot\frac{1}{4}=\dfrac{\frac{1}{32}}{\frac{3}{2}}$

$\frac{1}{32}\cdot\frac{2}{3}=\frac{2}{96}$

$=\boxed{\frac{1}{48}}$

f. $\frac{7}{3}\div 2\frac{1}{4}$

$\frac{7}{3}\div\frac{9}{4}$

$\frac{7}{3}\cdot\frac{4}{9}=\boxed{\frac{28}{27}}$

2. Solve each problem. Show all work.

a. Your goal is to complete 5½ miles of cardio at the gym today. If you ran for 1¾ of a mile, cycled for two-thirds of a mile, and used the elliptical for seven-tenths of a mile, how many more miles of cardio should you complete to reach your goal?

make easier

$1\frac{3}{4} + \frac{2}{3} + \frac{7}{10} + x = 5\frac{1}{2}$

$\frac{7}{4} + \frac{2}{3} + \frac{7}{10} + x = \frac{11}{2}$

$\frac{105}{60} + \frac{40}{60} + \frac{42}{60} + x = \frac{330}{60}$

$\frac{187}{60} + x = \frac{330}{60}$

$-\frac{187}{60} \quad -\frac{187}{60}$

$\frac{143}{60}$

Ans: $2\frac{23}{60}$ miles

b. Joe runs four-fifths of a mile every 10 minutes! How far can Joe run in an hour, assuming he maintains a steady pace? Round to the nearest tenth.

$\frac{4}{5}(6) = \frac{24}{5}$

4.8 miles

c. You are baking rice crispy treats for your friend's birthday. The recipe calls for 3¼ cups of marshmallows. If you need to make two and a half batches, how many cups of marshmallows will you need?

$3\frac{1}{4} \times 2\frac{1}{2}$

$\frac{13}{4} \cdot \frac{5}{2} = \frac{65}{8}$ $8\frac{1}{8}$ cups

d. Considering the situation from part c, each bag of marshmallows contains 5 cups. If each bag costs $1.49 and there is no tax, *how much money should you expect to spend on marshmallows*? *What amount of marshmallows will be left over* for you to enjoy while you are watching tonight's episode of America's Got Talent?

* You will need 2 bags.

* 1.49

× 2

$2.98

* $10 - 8\frac{1}{8}$

$10 - \frac{65}{8}$

$\frac{80}{8} - \frac{65}{8} = \frac{15}{8} = 1\frac{7}{8}$ cups

e. A recipe for 32 pancakes calls for 3½ cups of flour. You only want to make 24 pancakes. How much flour should you use? Give your answer as a fraction.

$\frac{3.5}{32} = \frac{x}{24}$

$\frac{32x}{32} = \frac{84}{32}$

$x = 2\frac{20}{32}$

$= 2\frac{5}{8}$ cups

H. Graphing Linear Functions

Use the given information to solve the problems.

Slope Formula: $\frac{y_2 - y_1}{x_2 - x_1}$

1. What is the slope between the points (-2, 7) and (-3, -8)?

$x_1\ y_1 \quad x_2\ y_2$

$\frac{-8-7}{-3-(-2)} = \frac{-15}{-1} = 15$

2. What is the slope between the points (-4,-6) and (1,-4)?

$x_1\ y_1 \quad x_2\ y_2$

$\frac{-4-(-6)}{1-(-4)} = \frac{2}{5}$

What is the slope of each line?

3. $y = 3x + 12$ Slope: 3

4. $\frac{7y}{7} = \frac{9}{7} - \frac{3x}{7}$ Slope: $-3/7$

$y = \frac{-3x}{7} + \frac{9}{7}$

5. $-3x = y + 2$
$-2 \quad -2$
$-3x - 2 = y$ Slope: -3

6. $x = 9$ Slope: Undefined

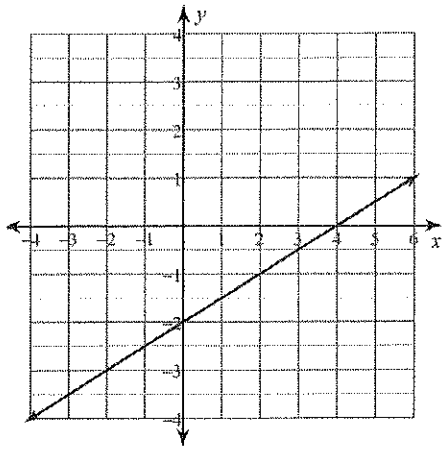
7. $y = -14$ Slope: zero

H.O.Y → y =
↓
zero slope
↓
horizontal line

V.U.X → x =
↓
undefined slope
↓
vertical line

Name the x-intercept and y-intercept of each line. You should write as an ordered pair.

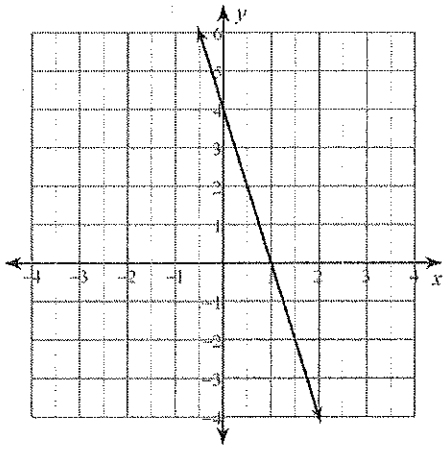
8.



x-intercept: (4,0)

y-intercept: (0,-2)

9.



x-intercept: (1,0)

y-intercept: (0,4)

10. A line is given by the equation y = -½x - 5. What is the slope of the ***perpendicular*** line?

Opposite, reciprocal slope

2

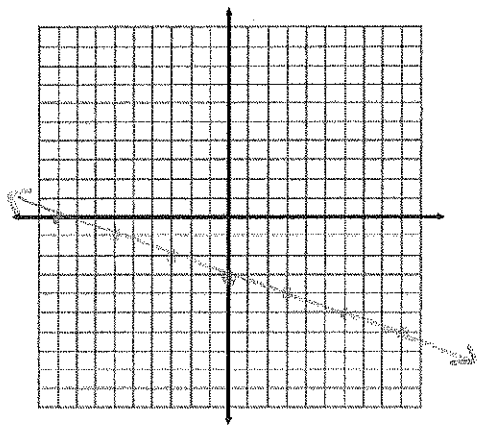
11. A line is given by the equation y = -9x -3. What is the slope of the ***parallel*** line?

-9

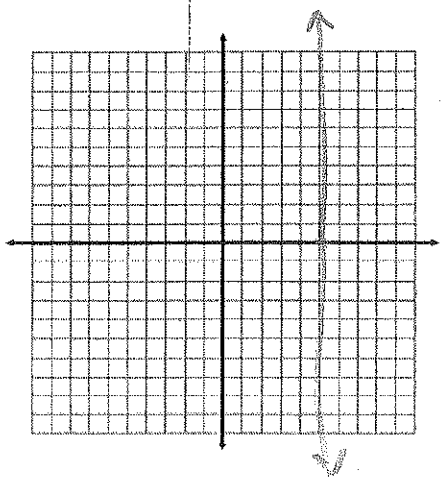
Same slope

Graph each line.

12. $\frac{3y}{3} = \frac{-x}{3} - \frac{9}{3}$ $y = -\frac{1}{3}x - 3$



13. x = 5



I. Factoring Polynomials

Re-write by factoring out the Greatest Common Factor (GCF) from all terms.

1. $-60x^5 + 20x^3 - 50x$

$-10x(6x^4 - 2x^2 + 5)$

2. $-54uv^3 - 60v - 54$

$-6(9v^3 + 10v + 9)$

3. $16u^3v^2 + 16u^3v + 4u^2v$

$4u^2v(4uv + 4u + 1)$

Rewrite by factoring using the Difference of Squares.

4. $x^2 - 4$

$(x-2)(x+2)$

5. $25r^2 - 9$

$(5r-3)(5r+3)$

6. $9m^2 - 25$

$(3m-5)(3m+5)$

Rewrite by factoring the trinomial. (undo FOIL)

7. $n^2 + 14n + 48$

$(n+8)(n+6)$

8. $x^2 + 8x - 9$

$(x+9)(x-1)$

9. $n^2 + 3n - 54$

$(n+9)(n-6)$

Factor completely, using a combination of the techniques above.

10. $-5x^2 + 15x + 20$

$-5(x^2 - 3x - 4)$

$-5(x-4)(x+1)$

11. $4n^2 - 32n + 64$

$4(n^2 - 8n + 16)$

$4(n-4)(n-4)$

12. $12n^2 - 3$

$3(4n^2 - 1)$

$3(2n-1)(2n+1)$

J. Properties of Exponents

Simplify using the properties of exponents (raising a power to a power, multiplying exponents, dividing exponents, using 0 as an exponent). All variable should be combined, and only written once. There should not be any parenthesis in your final answer.

Remember your Jingle!

89. $-2xy^4 \cdot -4yx^4$

$8x^5y^5$

90. $2y \cdot -2yx^3$

$-4x^3y^2$

91. $-3xy^4 \cdot 2y^4$

$-6xy^8$

92. $(4u^3)^2$

$16u^6$

93. $(4x^3y^3)^0$

1

94. $(2x^2y^4)^3$

$8x^6y^{12}$

95. $\dfrac{4x^3y}{3xy^4}$

$\dfrac{4x^2}{3y^3}$

96. $\dfrac{12x^6y^2}{3y^4}$

$\dfrac{4}{y^2}$

97. $\dfrac{3x^2y^2}{yx^4}$

$\dfrac{3y}{x^2}$