## SI Worksheet 1

## Fractions

1) $\frac{3}{7}+\frac{3}{8}$
2) $\frac{18}{15}-\frac{21}{23}$
3) $\frac{2}{3} \times \frac{y}{8}$
4) $\frac{n}{m} \div \frac{8}{3}$
5) $\frac{x^{2}}{3}+\frac{4}{5} \div \frac{x+7}{x+5} \div \frac{5}{2}-\frac{4 x^{2}+6 x+8}{x+5} \times 8$

## Lines and Linear Equations

Write down the equation of the line passing through the two points in point-slope form and slope-intercept form.
$6) \quad(-2,4)$ and ( 1,10 )
7)
$(8,2)$ and $(14,-7)$
8) $(-4,8)$ and (-1, - 20)

## Parallel and Perpendicular

9) $\quad y=\frac{7}{3} x+1$ and $3 y+7 x=-10$. Parallel or Perpendicular?
10) Given $3 x-14 y=4$, find the equations of the lines that pass through the point $(-7,2)$ and are parallel and perpendicular to the given equation.

## Factoring Quadratics

Factor completely
11)
$81 x^{2}-49$
12) $2 x^{3}-16 x^{2}-18 x$
13) $a^{2}+2 a b+b^{2}$

Find the roots
14) $(x-4)^{2}-9=0$
15) $x^{2}+14 x+45=0$
16) $x^{3}-5 x^{2}-4 x+20=0$

## Rational Expressions and Equations

17) $\frac{x^{2}-16}{x^{3}+64}$
18) $\frac{x^{2}-2 x-8}{2 x^{2}-8 x-24} \div \frac{x^{2}-9 x+20}{x^{2}-11 x+30}$
19) $\frac{x+10}{(3 x+8)^{3}}+\frac{x}{(3 x+8)^{2}}$

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## Challenge Problems

Jar Jar Binks is 6.5 feet tall. Yoda is 2 feet tall. If Jar Jar is standing 2 feet away from a wall, and Yoda is standing 4 feet away from Jar Jar, graph and write the equation for the line that is passing through the tops of their heads. What is the equation of the line passing through the origin and is perpendicular to the first one? Challenge: what is the equation of a parabola with its vertex on Jar Jar's head passing through Yoda's head? Go ahead and graph this one, too.

