

Welding Labor Costs Worksheet

Name

Key

1. One employee is using a wire welder and can do the job in 5 hours. Another employee is using a stick welder and can do the job in 6.5 hours. If they are both working on the job, how long will it take?

	Time	Amount of fence done in 1 hr
Wire Welder	5 hrs	$\frac{1}{5}$
Stick Welder	6.5 hrs	$\frac{1}{6.5}$
Both	x hrs	$\frac{1}{x}$

$$\left[\frac{1}{5} + \frac{1}{6.5} = \frac{1}{x} \right] 32.5x$$

$$6.5x + 5x = 32.5$$

$$11.5x = 32.5$$

$$x = \frac{32.5}{11.5} \approx 2.8 \text{ hrs}$$

$$.8 \text{ hr} \cdot \frac{60 \text{ min}}{1 \text{ hr}} = 48 \text{ min}$$

$$\text{OR } 2 \text{ hrs } 48 \text{ minutes}$$

2. One employee is using a wire welder and can do the job in 4 hours. Another employee is using a stick welder and can do the job in 5 hours 45 minutes. If they are both working on the job, how long will it take?

$$\frac{45}{60} = \frac{3}{4} = .75$$

	Time	Amount of fence done in 1 hr
Wire Welder	4 hrs	$\frac{1}{4}$
Stick Welder	5.75 hrs	$\frac{1}{5.75}$
Both	x hrs	$\frac{1}{x}$

$$\left[\frac{1}{4} + \frac{1}{5.75} = \frac{1}{x} \right] 23x$$

$$5.75x + 4x = 23$$

$$9.75x = 23$$

$$x = \frac{23}{9.75} = 2.4 \text{ hrs or } 2 \text{ hr } 24 \text{ min}$$

$$.4 \text{ hr} \cdot \frac{60 \text{ min}}{1 \text{ hr}} = 24 \text{ min}$$

3. A company hires both cutters and welders to manufacture parts. A cutter makes \$12 an hour while the welder makes \$25 an hour. Write an equation using c for cutter and w for welder to represent the cost for labor. If a cutter works 18 hours and the welder works 10 hours on a job, how much is the cost for labor?

$$\text{Cost} = 12c + 25w$$

$$\text{Cost} = 12(18) + 25(10)$$

$$\text{Cost} = 216 + 250$$

$$\text{Cost} = 466$$

$$c = 18 \text{ hr}$$

$$w = 10 \text{ hr}$$

$$\text{Cutter} = c$$

$$\text{Welder} = w$$

4. A company hires ^ccutters, ^wwelders, and ^ppainters to manufacture parts. A cutter makes \$12 an hour, the welder makes \$20.50 an hour, and the painter makes \$8.50 an hour. Write an equation using c for cutter, w for welder, and p for painter to represent the cost for labor. If a cutter works 12 hours, the welder works 8 hours on a job, and the painter works 2 hours, how much is the cost for labor?

c = cutter = \$12
 w = welder = \$20.50
 p = painter = \$8.50

$$\begin{aligned} \text{Cost} &= 12c + 20.50w + 8.50p \\ \text{Cost} &= 12(12) + 20.50(8) + 8.50(2) \\ \text{Cost} &= 144 + 164 + 17 \\ \text{Cost} &= \$325 \end{aligned}$$

5. One pump can fill a tank with oil in 3 hours. A second pump can fill the same tank in 4 hours. If both pumps are used at the same time, how long will they take to fill the tank?

	Time to fill tank	Amount of tank filled in 1 hour
Pump 1	3 hrs	$\frac{1}{3}$
Pump 2	4 hrs	$\frac{1}{4}$
Both pumps	x hrs	$\frac{1}{x}$

$$\begin{aligned} \left[\frac{1}{3} + \frac{1}{4} = \frac{1}{x} \right] & \quad \text{LCD } 12x \\ 4x + 3x &= 12 \\ 7x &= 12 \\ x &= \frac{12}{7} = 1.7 \text{ hrs} \end{aligned}$$

6. Ann can trim hedges around her property in 8 hours using an electric hedge trimmer. Dave can do the same job in 15 hours using a manual trimmer. How long will it take them to trim the hedges together?

	Time	Amount of hedges done in 1 hr
Ann	8 hrs	$\frac{1}{8}$
Dave	15 hrs	$\frac{1}{15}$
Both	x hrs	$\frac{1}{x}$

$$\begin{aligned} \left[\frac{1}{8} + \frac{1}{15} = \frac{1}{x} \right] & \quad \text{LCD } 120x \\ 15x + 8x &= 120 \\ 23x &= 120 \\ x &= \frac{120}{23} = 5.2 \text{ hrs} \end{aligned}$$