FRACTIONS AND PROPORTIONS

1. Calculate and simplify:

a) $\dfrac{4}{5} - \dfrac{1}{2} \times \left(\dfrac{2}{5} + 1 \right) =$

b) $\dfrac{1}{3} \times \left(\dfrac{5}{4} - \dfrac{7}{12} \right) =$

c) $\left(\dfrac{3}{2} - \dfrac{2}{5} \right) \div \left(1 - \dfrac{2}{5} \right) =$

2. Find the value of x:

a) x is the 20% of 350	b) x is the 120% of 80
c) 25 % of x is 35	d) 40% of x is 80

3. You are at Superstore, and you see that 5 oranges cost $2.35. You need 25 oranges to make a huge fruit salad. How much will 25 oranges cost?

4. If 7 electricians can wire some new houses in 18 days , how many electricians would be needed to do the job in 9 days ?

5. It takes 1300 kilowatts of electricity to keep 5 washing machines running for an hour. How many kilowatts would it take to keep 250 washing machines running for an hour?

6. In order to pass her driving test, Lori must answer 75% of the questions correctly. There are a total of 84 questions. How many questions will Lori need to answer correctly to pass the test?

7. Cameron bought ice skates that were on sale for 15% off the usual price. If the ice skates usually cost $75, what is the sale price?
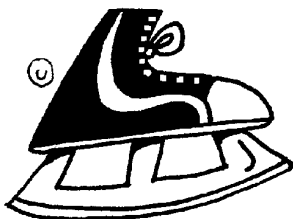
SOLUTIONS

1. Calculate and simplify:

a) $\dfrac{4}{5} - \dfrac{1}{2} \times \left(\dfrac{2}{5}+1\right) = \dfrac{4}{5} - \dfrac{1}{2} \times \dfrac{7}{5} = \dfrac{4}{5} - \dfrac{7}{10} = \dfrac{8}{10} - \dfrac{7}{10} = \dfrac{1}{10}$

b) $\dfrac{1}{3} \times \left(\dfrac{5}{4} - \dfrac{7}{12}\right) = \dfrac{1}{3} \times \left(\dfrac{15}{12} - \dfrac{7}{12}\right) = \dfrac{1}{3} \times \dfrac{8}{12} = \dfrac{1}{3} \times \dfrac{2}{3} = \dfrac{2}{9}$

c) $\left(\dfrac{3}{2} - \dfrac{2}{5}\right) \div \left(1 - \dfrac{2}{5}\right) = \left(\dfrac{15}{10} - \dfrac{4}{10}\right) \div \left(\dfrac{5}{5} - \dfrac{2}{5}\right) = \dfrac{11}{10} \div \dfrac{3}{5} = \dfrac{11 \times 5}{10 \times 3} = \dfrac{11}{6}$

2. Find the value of x:

a) x is the 20% of 350	b) x is the 120% of 80
$\dfrac{20}{100}$ of $350 = \dfrac{20 \times 350}{100} = 70$	$\dfrac{120}{100}$ of $80 = \dfrac{120 \times 80}{100} = 96$
c) 25 % of x is 35	d) 40% of x is 80
$\dfrac{25}{100} = \dfrac{35}{x} \rightarrow 25x = 3500$ $\rightarrow x = 3500 \div 25 = 140$	$\dfrac{40}{100} = \dfrac{80}{x} \rightarrow x = 200$

3. You are at Superstore, and you see that 5 oranges cost $2.35. You need 25 oranges to make a huge fruit salad. How much will 25 oranges cost?

$\dfrac{5}{25} = \dfrac{2.35}{x} \rightarrow 5x = 2.35 \times 25 = 58.75$

$x = 58.75 \div 5 = 11.75$

Solution: They will cost $11.75

4. If 7 electricians can wire some new houses in 18 days , how many electricians would be needed to do the job in 9 days ?

Inverse proportion:

$\dfrac{7}{x} = \dfrac{9}{18} \rightarrow 7 \times 18 = 9x \rightarrow x = 126 \div 9 = 14$

Solution: It would be needed 14 electricians

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5. It takes 1300 kilowatts of electricity to keep 5 washing machines running for an hour. How many kilowatts would it take to keep 250 washing machines running for an hour?

Direct proportion:
$$\frac{1300}{5} = \frac{x}{250} \rightarrow 1300 \times 250 = 5x \rightarrow x = 325000 \div 5 = 65000$$
Solution: 65000 kilowatts

6. In order to pass her driving test, Lori must answer 75% of the questions correctly. There are a total of 84 questions. How many questions will Lori need to answer correctly to pass the test?

$$75\% \text{ of } 84 = \frac{75}{100} \text{ of } 84 = \frac{75 \times 84}{100} = 63$$

Solution: Lori need to answer correctly 63 questions

7. Cameron bought ice skates that were on sale for 15% off the usual price. If the ice skates usually cost $75, what is the sale price?
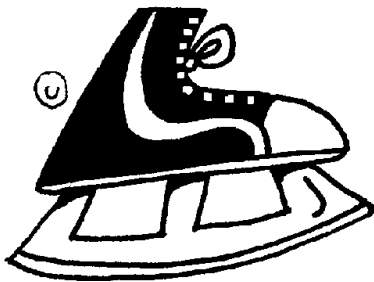
$$15\% \text{ of } 75 = \frac{15}{100} \text{ of } 75 = \frac{15 \times 75}{100} = 11.25$$

$$75 - 11.25 = 63.75$$
The sale price is $63.75