Year 6 Worksheet 5 - Proportions and ratios

Question 1: Use cross multiplication to solve the following ratios.

2:3 20:30	1:4 2:_	3:9 12:__
3:30 15:___	5:10 35:___	1:4 4:_
4:16 12:___	5:15 20:___	2:4 4:_
2:12 8:__	4:36 8:__	2:6 6:_
3:15 9:__	4:28 16:__	7:25 14:___

Question 2: Use cross multiplication to solve the following proportions.

$\dfrac{5}{6} = \dfrac{15}{18}$	$\dfrac{}{5} = \dfrac{9}{15}$	$\dfrac{2}{} = \dfrac{6}{15}$
$\dfrac{1}{} = \dfrac{9}{27}$	$\dfrac{1}{2} = \dfrac{10}{}$	$\dfrac{}{5} = \dfrac{12}{15}$
$\dfrac{5}{8} = \dfrac{30}{}$	$\dfrac{9}{45} = \dfrac{1}{}$	$\dfrac{3}{4} = \dfrac{}{12}$
$\dfrac{5}{} = \dfrac{10}{16}$	$\dfrac{9}{15} = \dfrac{}{5}$	$\dfrac{}{5} = \dfrac{16}{20}$

Question 3: Answer the following.

1	A recipe calls for 2 cups of flour to make 24 cookies. How much flour is needed to make 36 cookies?
2	A gardener mixes soil and sand in a ratio of 5:2 to make potting soil. If she needs 25 kg of potting soil, how much sand does she need?
3	A scale drawing of a garden has a scale of 1 cm on the drawing representing 5 meters in real life. If the drawing of a tree is 4 cm tall, how tall is the tree in real life?
4	It takes 6 hours for 3 painters to paint a wall. How many hours would it take for 5 painters to paint the same wall?

5	To make orange juice, you mix 2 parts of orange concentrate with 5 parts of water. How much water should you mix with 4 cups of orange concentrate?
6	A painter wants to mix red paint and white paint in a ratio of 3:7 to make a light pink color. If she needs 60 liters of pink paint, how much white paint does she need?
7	A fruit juice blend is made by mixing apple juice and orange juice in a ratio of 4:3. If you want to make 35 litres of the blend, how much orange juice do you need?
8	A model train is built using a scale of 1 cm on the model representing 12 meters in real life. If the model train is 12 cm long, how long is the actual train?

9	Amy and Ben share their pocket money in a ratio of 3:5. If Amy gets $12, how much do they have together?
10	The exchange rate between Australian Dollars (AUD) and US Dollars (USD) is 1 AUD = 0.75 USD. If you exchange 200 AUD, how much USD do you get?

Question 4: Answer the following.

1	A recipe for a fruit smoothie calls for a ratio of 2 parts of strawberries to 3 parts of bananas. If you want to make 10 cups of the smoothie, how many cups of bananas do you need?
2	The scale on a map is 1 cm on the map representing 5 km in real life. If the distance between two towns on the map is 15 cm, what is the actual distance between the towns?

3	A fence that is 1.5 meters tall casts a shadow that is 4.5 meters long. If a nearby tree casts a shadow that is 7.5 meters long, how tall is the tree? (Hint: Try to simplify the given ratio!)
4	Emma and Liam share a collection of stamps in a ratio of 7:9. If Emma has 28 stamps, how many stamps do they have in total?
5	The ratio of ages of two students is 4:5. If one student is 16 years old, how old is the other student?
6	Tom and Jerry share their allowance in a ratio of 2:3. If Tom gets $20, how much do they have together?

7	John and Susan share a bag of candies in a ratio of 5:3. If John has 30 candies, how many candies do they have in total?
8	In a bag of marbles, the ratio of red marbles to blue marbles is 3:5. If there are a total of 64 marbles, how many are red?
9	A candy store sells 4 cups of candy for $12. How much would it cost to buy 7 cups of candy?
10	The exchange rate between US Dollars and Euros is 1 USD = 0.85 EUR. If you have $120, how many Euros do you have?

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Answer Key

Question 1: Use cross multiplication to solve the following ratios.

2:3 20:<u>30</u>	1:4 2:8	3:9 12:36
3:30 15:150	5:10 35:70	1:4 4:16
4:16 12:48	5:15 20:60	2:4 4:8
2:12 8:48	4:36 8:72	2:6 6:18
3:15 9:45	4:28 16:112	7:25 14:50

Question 2: Use cross multiplication to solve the following proportions.

$\dfrac{5}{6} = \dfrac{15}{18}$	$\dfrac{3}{5} = \dfrac{9}{15}$	$\dfrac{2}{5} = \dfrac{6}{15}$
$\dfrac{1}{3} = \dfrac{9}{27}$	$\dfrac{1}{2} = \dfrac{10}{20}$	$\dfrac{4}{5} = \dfrac{12}{15}$
$\dfrac{5}{8} = \dfrac{30}{48}$	$\dfrac{9}{45} = \dfrac{1}{5}$	$\dfrac{3}{4} = \dfrac{9}{12}$
$\dfrac{5}{8} = \dfrac{10}{16}$	$\dfrac{9}{15} = \dfrac{3}{5}$	$\dfrac{4}{5} = \dfrac{16}{20}$

Question 3: Answer the following.

1	A recipe calls for 2 cups of flour to make 24 cookies. How much flour is needed to make 36 cookies? Solution: Set up a proportion: 2 cups / 24 cookies = x cups / 36 cookies Cross-multiply and solve for x: 2 * 36 = 24 * x x = 3 cups You need 3 cups of flour to make 36 cookies.
2	A gardener mixes soil and sand in a ratio of 5:2 to make potting soil. If she needs 25 kg of potting soil, how much sand does she need? Solution: Set up a proportion: 5 parts / 2 parts = 28 kg / x kg Cross-multiply and solve for x: 5x = 50 x = 10 kg She needs 10 kg of sand.
3	A scale drawing of a garden has a scale of 1 cm on the drawing representing 5 meters in real life. If the drawing of a tree is 4 cm tall, how tall is the tree in real life? Solution: The tree is 20 meters tall in real life.
4	It takes 6 hours for 3 painters to paint a wall. How many hours would it take for 5 painters to paint the same wall? Solution: It would take 10 hours for 5 painters.
5	To make orange juice, you mix 2 parts of orange concentrate with 5 parts of water. How much water should you mix with 4 cups of orange concentrate? Solution: You should mix 10 cups of water.

6	A painter wants to mix red paint and white paint in a ratio of 3:7 to make a light pink color. If she needs 60 liters of pink paint, how much white paint does she need? Solution: R : W 3:7 -> 10 pink 18:42 -> 60 pink
7	A fruit juice blend is made by mixing apple juice and orange juice in a ratio of 4:3. If you want to make 35 liters of the blend, how much orange juice do you need? Solution: 4:3 = 7 liters 20:15 = 35 liters 15 orange juice
8	A model train is built using a scale of 1 cm on the model representing 12 meters in real life. If the model train is 48 cm long, how long is the actual train? Solution: cm:m 1:12 12:144 Real train: 144 m
9	Amy and Ben share their pocket money in a ratio of 3:5. If Amy gets $12, how much do they have together? Solution: Set up a proportion: 3 parts / 5 parts = $12 / x dollars Cross-multiply and solve for x: 3x = 60 x = 20 dollars They have a total of $20.

10	The exchange rate between Australian Dollars (AUD) and US Dollars (USD) is 1 AUD = 0.75 USD. If you exchange 200 AUD, how much USD do you get? Solution: Set up a proportion: 1 AUD / 0.75 USD = 200 AUD / x USD Cross-multiply and solve for x: 1 * x = 0.75 * 200 x = 150 USD You get 150 USD.

Question 4: Answer the following.

1	A recipe for a fruit smoothie calls for a ratio of 2 parts of strawberries to 3 parts of bananas. If you want to make 10 cups of the smoothie, how many cups of bananas do you need? Solution: 2 : 3 -> 5 parts -> 1 cup 20: 30 -> 50 parts -> 10 cups
2	The scale on a map is 1 cm on the map representing 5 km in real life. If the distance between two towns on the map is 15 cm, what is the actual distance between the towns? Solution: 1:5 15:75 The actual distance between the towns is 75 km.
3	A fence that is 1.5 meters tall casts a shadow that is 4.5 meters long. If a nearby tree casts a shadow that is 7.5 meters long, how tall is the tree? Solution: Tall : shadow 1.5 : 4.5 1 : 3 (Simplification) 2.5:7.5 The tree is 2.5 meters tall.

4	Emma and Liam share a collection of stamps in a ratio of 7:9. If Emma has 28 stamps, how many stamps do they have in total? Solution: 7:9 -> 16 Stamps 28:36 -> 64 Stamps
5	The ratio of ages of two students is 4:5. If one student is 16 years old, how old is the other student? Solution: Given ratio: 4:5 Other student's age = (5/4) * 16 = 20 The other student is 20 years old.
6	Tom and Jerry share their allowance in a ratio of 2:3. If Tom gets $20, how much do they have together? Solution: Given ratio: 2:3 Total parts = 2 + 3 = 5 Total money = (5/2) * 20 = 50 They have a total of $50.
7	John and Susan share a bag of candies in a ratio of 5:3. If John has 30 candies, how many candies do they have in total? Solution: 5:3 = 8 30:18 = 48 They have a total of 48 candies.
8	In a bag of marbles, the ratio of red marbles to blue marbles is 3:5. If there are a total of 64 marbles, how many are red? Solution: Given ratio: 3:5 Total parts = 3 + 5 = 8 Red marbles = (3/8) * 64 = 24 There are 24 red marbles.

9	A candy store sells 4 pounds of candy for $12. How much would it cost to buy 7 pounds of candy? Solution: Set up a proportion: 4 pounds / $12 = 7 pounds / x dollars Cross-multiply and solve for x: 4 * x = 12 * 7 x = 21 dollars It would cost $21 to buy 7 pounds of candy.
10	The exchange rate between US Dollars and Euros is 1 USD = 0.85 EUR. If you have $120, how many Euros do you have? Solution: Set up a proportion: 1 USD / 0.85 EUR = 120 USD / x EUR Cross-multiply and solve for x: 1 * x = 0.85 * 120 x = 102 EUR You have 102 Euros.