School Name
Mathematics Test 2017

Fractions

Year 7

Skills and Knowledge Assessed:

- Compare fractions using equivalence. Locate and represent positive and negative fractions and mixed numbers on a number line (ACMNA152)
- Solve problems involving addition and subtraction of fractions, including those with unrelated denominators (ACMNA153)
- Multiply and divide fractions and decimals using efficient written strategies and digital technologies (ACMNA154)
- Express one quantity as a fraction of another, with and without the use of digital technologies (ACMNA155)

Name_____

Answer all questions in the spaces provided on this test paper by:

Writing the answer in the box provided.

or

Shading in the bubble for the correct answer from the four choices provided.

Show any working out on the test paper.   Calculators are **not** allowed.

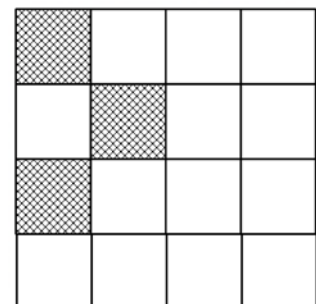**1.** In which pair of fractions are both denominators equal to 5?

☐ $\frac{1}{5}$ and $\frac{5}{8}$ ☐ $\frac{3}{5}$ and $\frac{1}{5}$ ☐ $\frac{5}{8}$ and $\frac{5}{9}$ ☐ $\frac{5}{8}$ and $\frac{3}{5}$

---

2. Which pair of fractions are both less than $\frac{1}{2}$?

☐ $\frac{1}{5}$ and $\frac{1}{6}$ ☐ $\frac{5}{8}$ and $\frac{3}{4}$ ☐ $\frac{5}{8}$ and $\frac{1}{5}$ ☐ $\frac{1}{5}$ and $\frac{5}{8}$

---

3. The fraction of the diagram which is shaded is :

☐ $\frac{3}{8}$ ☐ $\frac{3}{13}$

☐ $\frac{3}{16}$ ☐ $\frac{3}{20}$

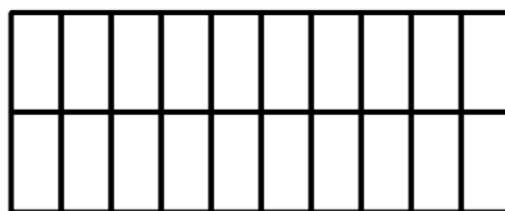| 4.	The photo shows a group of pets. What fraction of the pets are dogs? ☐ $\dfrac{3}{8}$ ☐ $\dfrac{3}{5}$ ☐ $\dfrac{1}{2}$ ☐ $\dfrac{5}{8}$
5.	Shade $\dfrac{3}{4}$ of the shape shown.
6.	Write $\dfrac{9}{5}$ as a mixed number. ☐ $1\dfrac{3}{5}$ ☐ $1\dfrac{4}{5}$ ☐ $1\dfrac{4}{9}$ ☐ $1\dfrac{5}{9}$
7.	Write $2\dfrac{2}{3}$ as an improper fraction.
8.	Simplify the fraction $\dfrac{12}{18}$.
9.	The simplest equivalent fraction to $\dfrac{25}{30}$ is : ☐ $\dfrac{3}{5}$ ☐ $\dfrac{4}{5}$ ☐ $\dfrac{5}{6}$ ☐ $\dfrac{5}{8}$

10. Which fraction is **not** equivalent to $\dfrac{5}{9}$?

☐ $\dfrac{10}{19}$ ☐ $\dfrac{15}{27}$ ☐ $\dfrac{20}{36}$ ☐ $\dfrac{50}{90}$

11. Write these fractions in order from smallest to largest.

$$\dfrac{7}{10}, \quad \dfrac{1}{2}, \quad \dfrac{3}{10}, \quad \dfrac{9}{10}$$

12. $\dfrac{4}{15} + \dfrac{3}{15} = \ ?$

13. $\dfrac{1}{5} \times \dfrac{7}{10} = \ ?$

14. $\dfrac{2}{5} \div \dfrac{2}{3} = \ ?$

15. Find $\dfrac{4}{5}$ of 55 kilograms.

16.

Complete the missing numbers to make pairs of equivalent fractions.

a) $\dfrac{16}{20} = \dfrac{\square}{5}$ b) $\dfrac{3}{10} = \dfrac{15}{\square}$

17.

Which of these fractions is **not** equivalent to $\dfrac{9}{15}$?

$\square$ $\dfrac{3}{5}$ $\square$ $\dfrac{6}{10}$ $\square$ $\dfrac{12}{20}$ $\square$ $\dfrac{15}{24}$

18.

Write one of the symbols $<$, $>$ or $=$ in the boxes below to make true sentences.

a) $\dfrac{3}{8} \;\square\; \dfrac{15}{32}$ b) $\dfrac{8}{10} \;\square\; \dfrac{4}{5}$

19.

What fraction is 4 km of 36 km? (Answer in simplest form).

$\dfrac{\square}{\square}$

20.

Mark the position of $\dfrac{5}{6}$ on the number line below.
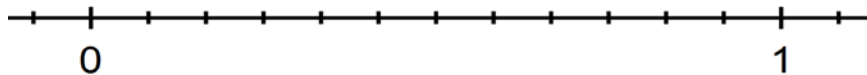
21.

Mark the position of $-1\tfrac{1}{4}$ on the number line below.
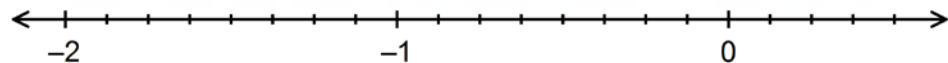
22.

Find the answer to the addition, giving your answer in simplest form;

$\dfrac{2}{5} + \dfrac{3}{10} =$ $\dfrac{\square}{\square}$

23. At 5 pm, $\dfrac{2}{3}$ of Harriett's team had arrived at training.

In the next fifteen minutes, another $\dfrac{1}{6}$ of the team arrived.

What fraction of the team had arrived by 5:15 pm.

☐ $\dfrac{3}{4}$ ☐ $\dfrac{11}{12}$ ☐ $\dfrac{5}{6}$ ☐ $1\frac{1}{6}$

24. $\dfrac{3}{4} + \dfrac{1}{5} = ?$

☐ $\dfrac{4}{9}$ ☐ $\dfrac{17}{20}$ ☐ $\dfrac{9}{10}$ ☐ $\dfrac{19}{20}$

25. $\dfrac{5}{8} \times \dfrac{7}{10} = ?$

☐ $\dfrac{7}{16}$ ☐ $\dfrac{7}{18}$ ☐ $\dfrac{3}{20}$ ☐ $2\frac{3}{16}$

26. $\dfrac{16}{25} - \dfrac{3}{10} = ?$

☐ $\dfrac{14}{15}$ ☐ $\dfrac{17}{50}$ ☐ $\dfrac{7}{25}$ ☐ $\dfrac{1}{2}$

27. $\dfrac{4}{5} \div \dfrac{2}{25} = ?$

☐ $\dfrac{1}{10}$ ☐ $\dfrac{8}{125}$ ☐ $1\frac{1}{5}$ ☐ 10

28. Simplify $\dfrac{9}{10} + \dfrac{5}{16}.$

29. Simplify $\dfrac{5}{8} \times \dfrac{4}{15}$.

30. Simplify $\left(\dfrac{2}{3}\right)^3$.

31. $\dfrac{5}{8} \div \dfrac{5}{6} = ?$

32. What fraction is 16 hours of 2 ½ days? (Answer in simplest form).

33. Rewrite the numbers $\dfrac{3}{5}, \dfrac{7}{12}, \dfrac{11}{20},$ and $\dfrac{1}{3}$ in ascending order.

34. Write the reciprocal of these numbers.

a) $\dfrac{5}{12}$ b) $1\dfrac{3}{8}$

35. $2\dfrac{1}{5} + 1\dfrac{3}{20} = ?$

36.	$1\frac{2}{3} \times 2\frac{1}{4} = ?$
37.	$2\frac{2}{5} - 1\frac{7}{8} = ?$
38.	Kerrie bought $4\frac{1}{5}$ kg of fish and he gave $\frac{1}{3}$ of the fish to his mum and took the rest home to cook himself. How many kilograms of fish did he take home?
39.	Simplify $1\frac{7}{8} \div 1\frac{2}{3}$.
40.	If I start with two numbers which are both between 0 and 1, which of these operations will **always** give an answer which is also between 0 and 1. ☐ Adding the two numbers together ☐ Dividing the first number by the second ☐ Multiplying the two numbers together ☐ Subtracting the first number from the second
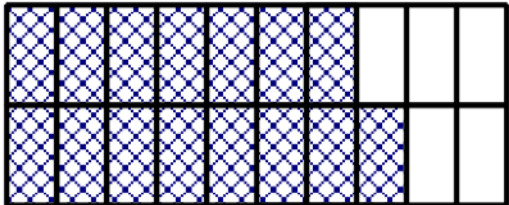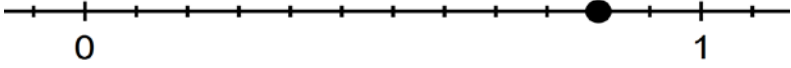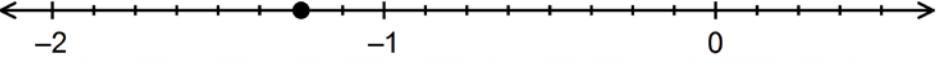
ANSWERS

Question	Working and Answer
1.	Denominator is the bottom, so $\dfrac{3}{5}$ and $\dfrac{1}{5}$ **2nd Answer**
2.	$\dfrac{1}{5}$ and $\dfrac{1}{6}$ are both less than $\dfrac{1}{2}$. **1st Answer**
3.	3 parts out of 16, so $\dfrac{3}{16}$. **3rd Answer.**
4.	5 dogs out of 8 pets, so $\dfrac{5}{8}$. **4th Answer**
5.	Want $\dfrac{3}{4}$ of 20 parts so 3 out of every 4 and there are 5 lots of 4, so $3 \times 5 = 15$ Shade any 15 parts

Question	Working and Answer
6.	$\frac{9}{5} = \frac{5}{5} + \frac{4}{5} = 1\frac{4}{5}$ **2ⁿᵈ Answer**
7.	$2\frac{2}{3} = \frac{2 \times 3 + 2}{3} = \frac{8}{3}$
8.	$\frac{12}{18} = \frac{2}{3}$
9.	$\frac{25}{30} = \frac{5}{6}$ (dividing by 5) **3ʳᵈ Answer**
10.	$\frac{5}{9} = \frac{10}{18} \neq \frac{10}{19}$ **1ˢᵗ Answer**
11.	$\frac{7}{10}, \frac{1}{2}, \frac{3}{10}, \frac{9}{10} \quad = \frac{7}{10}, \frac{5}{10}, \frac{3}{10}, \frac{9}{10}$ $= \frac{3}{10}, \frac{5}{10}, \frac{7}{10}, \frac{9}{10}$ $= \frac{3}{10}, \frac{1}{2}, \frac{7}{10}, \frac{9}{10}$
12.	$\frac{4}{15} + \frac{3}{15} = \frac{7}{15}$
13.	$\frac{1}{5} \times \frac{7}{10} = \frac{7}{50}$
14.	$\frac{2}{5} \div \frac{2}{3} = \frac{2}{5} \times \frac{3}{2}$ $= \frac{6}{10}$ $= \frac{3}{5}$

Question	Working and Answer
15.	$\dfrac{4}{5}$ of 55 kilograms $= \dfrac{4}{\cancel{5}^{\,1}} \times \dfrac{\cancel{55}^{\,11}}{1} = 4 \times 11 = $ **44 kg**
16.	a) $\quad \dfrac{16}{20} = \dfrac{\boxed{4}}{5}$ $\qquad\qquad$ b) $\quad \dfrac{3}{10} = \dfrac{15}{\boxed{50}}$
17.	$\dfrac{3}{5} \times \dfrac{3}{3} = \dfrac{9}{15}$ $\qquad\qquad$ $\dfrac{3}{5} \times \dfrac{2}{2} = \dfrac{6}{10}$ $\dfrac{3}{5} \times \dfrac{4}{4} = \dfrac{12}{20}$ $\qquad\qquad$ $\dfrac{15}{24} = \dfrac{5}{8} \neq \dfrac{3}{5} \neq \dfrac{9}{15}$ **4$^{\text{th}}$ Answer**
18.	a) $\quad \dfrac{3}{8}\left(\dfrac{12}{32}\right) \boxed{<} \dfrac{15}{32}$ $\qquad\qquad$ b) $\quad \dfrac{8}{10} \boxed{=} \dfrac{4}{5} \times \dfrac{2}{2}$
19.	4 km out of 36 km $= \dfrac{4}{36} = \dfrac{1}{9}$
20.	 There are 12 divisions between 0 and 1 so $\dfrac{1}{6} = 2$ divisions $\dfrac{5}{6} = \dfrac{10}{12}$ so 10 divisions past 0
21.	
22.	$\dfrac{2}{5} + \dfrac{3}{10} = \dfrac{4}{10} + \dfrac{3}{10} = \dfrac{7}{10}$

Question	Working and Answer
23.	$\dfrac{2}{3} + \dfrac{1}{6} = \dfrac{4}{6} + \dfrac{1}{6} = \dfrac{5}{6}$ **3ʳᵈ Answer**
24.	$\dfrac{3}{4} + \dfrac{1}{5} = \dfrac{15}{20} + \dfrac{4}{20} = \mathbf{\dfrac{19}{20}}$ **4ᵗʰ Answer**
25.	$\dfrac{5}{8} \times \dfrac{7}{10} = \dfrac{1\ \cancel{5} \times 7}{8 \times \cancel{10}\ 2} \left(\text{or} = \dfrac{35}{80} \right)$ $\qquad = \mathbf{\dfrac{7}{16}}$ **1ˢᵗ Answer**
26.	$\dfrac{16}{25} - \dfrac{3}{10} = \dfrac{32}{50} - \dfrac{15}{50}$ $\qquad = \dfrac{17}{50}$ **2ⁿᵈ Answer**
27.	$\dfrac{4}{5} \div \dfrac{2}{25} = \dfrac{2\ \cancel{4}}{\cancel{5}\ 1} \times \dfrac{\cancel{25}\ 5}{\cancel{2}\ 1} \left(\text{or} = \dfrac{100}{10} \right)$ $\qquad = 2 \times 5$ $\qquad = 10$ **4ᵗʰ Answer**
28.	$\dfrac{9}{10} + \dfrac{5}{16} = \dfrac{72}{80} + \dfrac{25}{80}$ $\qquad = \dfrac{97}{80}$ $\qquad = \mathbf{1\frac{17}{80}}$
29.	$\dfrac{5}{8} \times \dfrac{4}{15} = \dfrac{\cancel{5}\ 1}{\cancel{8}\ 2} \times \dfrac{\cancel{4}\ 1}{\cancel{15}\ 3}$ $\qquad = \mathbf{\dfrac{1}{6}}$
30.	$\left(\dfrac{2}{3}\right)^3 = \dfrac{2^3}{3^3} = \mathbf{\dfrac{8}{27}}$

Question	Working and Answer
31.	$\dfrac{5}{8} \div \dfrac{5}{6} = \dfrac{\cancel{5}^{1}}{\cancel{8}^{4}} \times \dfrac{\cancel{6}^{3}}{\cancel{5}^{1}}$ $\qquad\quad = \dfrac{3}{4}$
32.	2 ½ days = 48+12 = 60 hours Fraction = $\dfrac{16}{60} = \dfrac{4}{15}$
33.	$\dfrac{3}{5} = \dfrac{36}{60}, \dfrac{7}{12} = \dfrac{35}{60}, \dfrac{11}{20} = \dfrac{33}{60},$ and $\dfrac{1}{3} = \dfrac{20}{60}$ So in acsending order they are: $\dfrac{1}{3}, \dfrac{11}{20}, \dfrac{7}{12},$ and $\dfrac{3}{5}$
34.	a) Reciprocal of $\dfrac{5}{12} = \dfrac{12}{5} = 2\frac{2}{5}$ b) Reciprocal of $1\frac{3}{8} =$ Reciprocal of $\dfrac{11}{8} = \dfrac{8}{11}$
35.	$2\frac{1}{5} + 1\frac{3}{20} = 3 + \dfrac{4}{20} + \dfrac{3}{20}$ $\qquad\qquad\quad = 3\frac{7}{20}$
36.	$1\frac{2}{3} \times 2\frac{1}{4} = \dfrac{5}{\cancel{3}^{1}} \times \dfrac{\cancel{9}^{3}}{4}$ $\qquad\qquad = \dfrac{15}{4}$ $\qquad\qquad = 3\frac{3}{4}$
37.	$2\frac{2}{5} - 1\frac{7}{8} = \dfrac{12}{5} - \dfrac{15}{8}$ $= \dfrac{96}{40} - \dfrac{75}{40}$ $= \dfrac{21}{40}$

Question	Working and Answer
38.	He gave his mum $\frac{1}{3}$, so $\frac{2}{3}$ is left. $\frac{2}{3}$ of $4\frac{1}{5}$ $= \frac{2}{\cancel{3}^1} \times \frac{\cancel{21}^7}{5}$ $= \frac{14}{5} = 2\frac{4}{5}$ **kg left**
39.	$1\frac{7}{8} \div 1\frac{2}{3} = \frac{15}{8} \div \frac{5}{3}$ $= \frac{\cancel{15}^3}{8} \times \frac{3}{\cancel{5}^1}$ $= \frac{9}{8}$ $= 1\frac{1}{8}$
40.	Adding the two numbers together won't always give a number between 0 and 1 e.g $\frac{3}{4} + \frac{1}{2} = 1\frac{1}{4}$ Dividing the two numbers won't always give a number between 0 and 1 e.g $\frac{3}{4} \div \frac{1}{2} = \frac{3}{4} \times \frac{2}{1} = \frac{6}{4} = 1\frac{1}{2}$ Multiplying the two numbers together will always give a number between 0 and 1 e.g $\frac{1}{2} \times \frac{3}{4} = \frac{3}{8}$ This will be true for all cases as the numerators are smaller than the denominators so the product of the numerators will be less than the product of the denominators Subtracting the two numbers won't always give a number between 0 and 1 e.g $\frac{1}{2} - \frac{3}{4} = -\frac{1}{4}$ **3rd Answer**