



Foundation-level examination by course unit 2011

SEF026 Essential Foundation Mathematics

Duration: 2 hours

Date and time: 09 November 2011, 13:00h–15:00h

Apart from this page, you are not permitted to read the contents of this question paper until instructed to do so by an invigilator.

You should attempt all questions. Record each answer by ticking the corresponding box on the answer form. To pass the examination you need 18 correct answers.

Calculators are NOT permitted in this examination. The unauthorized use of a calculator constitutes an examination offence.

Candidates should note that the Examination and Assessment Regulations state that possession of unauthorized materials by any candidate who is under examination conditions is an assessment offence. Please check your pockets now for any notes that you may have forgotten that are in your possession. If you have any, then please raise your hand and give them to an invigilator now.

Exam papers must not be removed from the examination room.

Examiner(s): I. Tomašić

1. Compute the remainder of the following division: $2011 \div 7$.

[a] 0 [b] 1 [e] not in the list
[c] 2 [d] 5

2. Compute the quotient of the following division: $2011 \div 13$.

[a] 144 [b] 153 [e] not in the list
[c] 154 [d] 165

3. Factor 2220 into primes.

[a] $2^3 \cdot 3^2 \cdot 5^2 \cdot 7$ [b] $2^2 \cdot 3 \cdot 5 \cdot 37$ [e] not in the list
[c] $2 \cdot 5^2 \cdot 127$ [d] $2 \cdot 3^2 \cdot 5 \cdot 7$

4. Determine the number of primes in the interval $[15, 25]$, endpoints included.

[a] 1 [b] 2 [e] not in the list
[c] 3 [d] 4

5. Compute the greatest common divisor of 70 and 84.

[a] 2 [b] 7 [e] not in the list
[c] 14 [d] 18

6. Determine the least common multiple, x , of 48 and 56.

- [a] $1 \leq x < 100$ [b] $100 \leq x < 150$ [e] not in the list
[c] $150 \leq x < 250$ [d] $250 \leq x < 350$

7. Determine the greatest common divisor, x , of 12^2 and 15^2 .

- [a] $1 \leq x < 20$ [b] $20 \leq x < 40$ [e] not in the list
[c] $40 \leq x < 50$ [d] $50 \leq x < 60$

8. Determine the least common multiple of 120 and 20^2 .

- [a] $2^3 \cdot 3 \cdot 5^2$ [b] $2^4 \cdot 3^2 \cdot 5$ [e] not in the list
[c] $2^4 \cdot 3 \cdot 5^2$ [d] $2^3 \cdot 3^2 \cdot 5^2$

9. How many of the following fractions are reduced:

$$\frac{5}{34}, \frac{33}{147}, \frac{6}{21}, \frac{7}{43}?$$

- [a] 1 [b] 2 [e] not in the list
[c] 3 [d] 4

10. Write the decimal 1.75 as a reduced fraction.

- [a] $\frac{17}{4}$ [b] $\frac{175}{100}$ [e] not in the list
 [c] $\frac{35}{20}$ [d] $\frac{7}{4}$

11. Place the following fractions in ascending order:

$$\frac{3}{7}, \frac{5}{9}, \frac{6}{13}.$$

- [a] $\frac{3}{7} < \frac{5}{9} < \frac{6}{13}$ [b] $\frac{6}{13} < \frac{3}{7} < \frac{5}{9}$ [e] not in the list
 [c] $\frac{6}{13} < \frac{5}{9} < \frac{3}{7}$ [d] $\frac{3}{7} < \frac{6}{13} < \frac{5}{9}$

12. How many of the following inequalities are correct:

$$1 < \frac{2943}{2944}, \quad 1 > \frac{9998}{9997}, \quad 5 < \frac{79}{16}, \quad 100 > \frac{1001}{10}?$$

- [a] 1 [b] 2 [e] not in the list
 [c] 3 [d] 4

13. Evaluate

$$1 + \frac{1}{1 + \frac{2}{1 + \frac{4}{1 + \frac{6}{1}}}}.$$

- [a] $\frac{17}{11}$ [b] $\frac{16}{11}$ [e] not in the list
 [c] $\frac{5}{6}$ [d] $\frac{7}{6}$

14. Evaluate

$$\left(\frac{3}{10} + \frac{6}{5}\right) \div \left(4 - \frac{7}{28}\right).$$

[a] $\frac{7}{5}$

[b] $\frac{7}{4}$

[e] not in the list

[c] $\frac{45}{18}$

[d] $\frac{45}{8}$

15. Evaluate

$$\left(-\frac{1}{2}\right)^3 \times \frac{8}{5} + \left(\frac{1}{4} - \frac{3}{5}\right).$$

[a] $-\frac{11}{20}$

[b] $-\frac{23}{20}$

[e] not in the list

[c] $\frac{13}{20}$

[d] $\frac{1}{2}$

16. How many of the following inequalities are correct:

$$7 > \sqrt{50}, \quad 5 < 3\sqrt{3}, \quad 5 > \sqrt{4}\sqrt{6}, \quad 5 < \sqrt{4}\sqrt{7}?$$

[a] 0

[b] 1

[e] not in the list

[c] 2

[d] 3

17. Simplify $\sqrt{3375}$ to the form $a\sqrt{b}$ where b is square-free.

[a] $30\sqrt{375}$

[b] $15\sqrt{15}$

[e] not in the list

[c] $25\sqrt{5}$

[d] $35\sqrt{3}$

18. Simplify

$$6\sqrt{48} - 7\sqrt{27}.$$

[a] $3\sqrt{3}$

[b] $2\sqrt{6}$

[e] not in the list

[c] $-\sqrt{3}$

[d] $-\sqrt{21}$

19. Simplify, eliminating radicals at denominator,

$$\sqrt{\frac{7}{14} + \frac{1}{5} - \frac{5}{4} + 1}.$$

[a] $\frac{3}{\sqrt{20}}$

[b] $\frac{\sqrt{9}}{4\sqrt{5}}$

[e] not in the list

[c] $\frac{3}{10}\sqrt{5}$

[d] $\frac{1}{6}\sqrt{14}$

20. Simplify, eliminating radicals at denominator,

$$\sqrt{\frac{7}{3}} - \sqrt{\frac{3}{7}} + \sqrt{\frac{36}{21}}.$$

[a] $\frac{\sqrt{3}}{21}$

[b] $\frac{10}{\sqrt{21}}$

[e] not in the list

[c] $\frac{20}{21}\sqrt{21}$

[d] $\frac{10}{21}\sqrt{21}$

21. How many of the following equalities are correct:

$$0.314 \times 10^3 = 31.4, \quad 0.0314 \times 10^2 = 31.4 \times 10^{-1},$$

$$2000 - 1 \times 10^2 = 1990, \quad 3141.5 \times 10^{-4} = 3.1415?$$

[a] 1

[b] 2

[e] not in the list

[c] 3

[d] 4

22. Estimate $x = \frac{44 \times 10^{-3} + 40.02 \times 10^{-2}}{2}$.

- [a] $0.022 < x < 0.024$ [b] $2.2 < x < 2.4$
[c] $2 < x < 2.2$ [d] $0.22 < x < 0.24$
[e] not in the list

23. Estimate $x = 2 \times 10^3 - 2 \times 10^{-3} + 3 \times 10^{-6}$.

- [a] $1999.999 < x < 2000$ [b] $1999.998 < x < 1999.999$
[c] $1999.997 < x < 1999.998$ [d] $1998.997 < x < 1998.999$
[e] not in the list

24. Estimate

$$x = \frac{15}{5 \times 10^{-1}} \times \frac{0.99 \times 10^3}{6}$$

- [a] $4 \times 10^4 < x < 5 \times 10^4$ [b] $3 \times 10^3 < x < 4 \times 10^3$
[c] $5 \times 10^4 < x < 6 \times 10^4$ [d] $5 \times 10^3 < x < 6 \times 10^3$
[e] not in the list

25. Determine the largest power of 10 smaller than

$$x = 10^4 \times \frac{14999}{300} \times \frac{1}{51}$$

- [a] 10^5 [b] 10^4 [e] not in the list
[c] 10^3 [d] 10^2