



EMIRATES AIRLINE PILOT APTITUDE

TEST

MATHEMATICS — PRACTICE PAPER (Model F)

COMPASS System | 50 Questions | Time Allowed: 40 Minutes | No Calculator Permitted

INSTRUCTIONS

- This paper contains 50 questions across 11 mathematical topics tested in the Emirates Airline COMPASS pilot aptitude assessment.
- Select the one best answer from four options (A, B, C, D) for each question.
- No calculator is permitted. All calculations must be performed mentally or on rough paper.
- Time allowed is 40 minutes. Aim to spend no more than 48 seconds per question.
- Attempt all questions. There is no negative marking.
- A full Answer Key with Explanations is provided at the end of this paper.

SECTION 1: Fractions & Percentages

Q1. A fuel reserve is 58% of a 12,000 L tank. How many litres are in reserve?

- A) 5,040 L
- B) 6,000 L
- C) 6,960 L
- D) 7,460 L

Q2. Express $9/(14)$ as a percentage, to 1 decimal place.

- A) 37.5%
- B) 42.0%
- C) 64.3%
- D) 62.5%

Q3. A pilot earns AED 41,000 monthly and receives a 13% increase. What is the new salary?

- A) AED 43,460
- B) AED 46,330
- C) AED 44,000
- D) AED 41,700

Q4. Simplify:

$$\frac{10}{\{15\}} + \frac{1}{\{15\}}$$

- A) $11/15$
- B) $11/24$
- C) $1/15$
- D) $10/16$

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Q5. A flight carries 312 passengers. 31% are in business class. How many are in economy?

- A) 199
- B) 215
- C) 287
- D) 96

SECTION 2: Speed, Distance & Time

Q6. An aircraft travels at 540 knots for 5 hours 0 minutes. What distance does it cover?

- A) 1,200 NM
- B) 960 NM
- C) 2700 NM
- D) 1,500 NM

Q7. A jet covers 1,950 km in 5.0 hours. What is its average speed?

- A) 600 km/h
- B) 750 km/h
- C) 450 km/h
- D) 390 km/h

Q8. Convert 350 knots to km/h. (1 knot = 1.852 km/h)

- A) 370.4 km/h
- B) 648.2 km/h
- C) 555.6 km/h
- D) 463.0 km/h

Q9. A flight route is 6,300 km long and the aircraft flies at 880 km/h. Estimate the flight time.

- A) 7.5 h
- B) 6.0 h
- C) 4.5 h
- D) 7.2 h

Q10. An aircraft descends from 37,200 ft at 2100 ft/min. How long does the descent take?

- A) 20 min
- B) 15 min
- C) 30 min
- D) 18 min

SECTION 3: Ratios & Scales

Q11. A chart has scale 1:600,000. A route measures 11 cm. What is the actual distance?

- A) 600 km
- B) 240 km
- C) 18 km
- D) 66 km

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Q12. Fuel and additive are mixed in the ratio 12:1. If 78 L of fuel are used, how much additive is needed?

- A) 6 L
- B) 8 L
- C) 5 L
- D) 12 L

Q13. A bonus of AED 12,600 is shared in the ratio 2:3:4. What is the largest share?

- A) AED 3,000
- B) AED 2,000
- C) AED 5,600
- D) AED 4,000

Q14. 10 engineers service 18 aircraft in 3 days. At the same rate, how many aircraft can 12 engineers service?

- A) 21 aircraft
- B) 30 aircraft
- C) 24 aircraft
- D) 18 aircraft

Q15. A runway is 10 cm on a map and 5.0 km in reality. What is the map scale?

- A) 1:50,000
- B) 1:25,000
- C) 1:100,000
- D) 1:50,000

SECTION 4: Unit Conversions

Q16. Convert 21,000 ft to metres. (1 ft = 0.3048 m)

- A) 3,657.6 m
- B) 4,572.0 m
- C) 6,096.0 m
- D) 6400.8 m

Q17. Convert 80,000 kg to pounds. (1 kg = 2.205 lb)

- A) 110,250 lb
- B) 132,300 lb
- C) 176,400 lb
- D) 165,375 lb

Q18. Convert 110°C to Fahrenheit. ($F = \frac{9}{5}C + 32$)

- A) 212°F
- B) 230°F
- C) 248°F
- D) 176°F

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Q19. Convert 16,800 lb to kg. (1 lb = 0.4536 kg)

- A) 5,443.2 kg
- B) 6,350.4 kg
- C) 7,257.6 kg
- D) 7,620.5 kg

Q20. Convert 1.1 nautical miles to metres. (1 NM = 1,852 m)

- A) 2,037 m
- B) 1,389 m
- C) 926 m
- D) 1,852 m

SECTION 5: Powers, Roots & Surds

Q21. Calculate: $2^{\{11\}}$.

- A) 8192
- B) 4096
- C) 2048
- D) 1024

Q22. Simplify: $\sqrt{256}$.

- A) 14
- B) 18
- C) 16
- D) 26

Q23. Calculate: $(9)^2 - (7)^2$.

- A) 32
- B) 49
- C) 81
- D) 100

Q24. Evaluate: $((8)^2)^2$.

- A) 64
- B) 32768
- C) 512
- D) 4096

Q25. Simplify: $\sqrt{0.00080}$.

- A) 0.014
- B) 0.007
- C) 0.070
- D) 0.028

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SECTION 6: Areas, Volumes & Spaces

Q26. A rectangular hangar is 150 m long and 48 m wide. What is its area?

- A) 4,800 m²
- B) 7,200 m²
- C) 3,600 m²
- D) 6,000 m²

Q27. A cylindrical tank has radius 4.0 m and height 10 m. Find its volume ($\pi \approx 3.14$).

- A) 78.50 m³
- B) 50.24 m³
- C) 31.40 m³
- D) 502.40 m³

Q28. A triangular taxiway marking has base 11 m and height 9 m. What is its area?

- A) 30 m²
- B) 49.5 m²
- C) 20 m²
- D) 12 m²

Q29. The wingspan of an aircraft is 74 m. What is the radius of the circle swept by one wingtip?

- A) 32 m
- B) 20 m
- C) 37 m
- D) 64 m

Q30. A cargo container measures 9 m × 8 m × 2.5 m. What is its volume?

- A) 20.0 m³
- B) 30.0 m³
- C) 180.0 m³
- D) 40.0 m³

SECTION 7: Probability & Statistics

Q31. A bag contains 10 red, 11 blue and 12 green balls. Probability of blue?

- A) 11/33
- B) 1/3
- C) 1/2
- D) 2/5

Q32. The scores are 74, 81, 88, 77, 85. What is the mean?

- A) 81
- B) 76
- C) 80
- D) 72

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Q33. A die is rolled twice. Probability of getting a multiple of 3 on both rolls?

- A) $1/2$
- B) $1/3$
- C) $1/9$
- D) $1/6$

Q34. Find the range of: 18, 41, 27, 66, 34.

- A) 42
- B) 48
- C) 56
- D) 36

Q35. The average of 6 scores is 78. What is their total?

- A) 390
- B) 84
- C) 468
- D) 546

SECTION 8: Algebraic Equations

Q36. Solve for x: $9x - 14 = 7x + 18$.

- A) $x = 6$
- B) $x = 16$
- C) $x = 10$
- D) $x = 14$

Q37. If $a = 8$ and $b = -7$, evaluate: $2a^2 - 3b$.

- A) 149
- B) 30
- C) 24
- D) 12

Q38. Factorise: $x^2 - 100$.

- A) $(x - 10)^2$
- B) $(x - 14)(x + 2)$
- C) $(x - 10)(x + 10)$
- D) $(x + 10)^2$

Q39. Solve for x: $2(x + 9) = 3x - 8$.

- A) $x = 10$
- B) $x = 20$
- C) $x = 4$
- D) $x = 14$

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Q40. If $8x + 3y = 21$ and $y = 2$, find x .

- A) 3
- B) 1
- C) 5
- D) 2

SECTION 9: Trigonometry

Q41. In a right triangle, adjacent = 12 and hypotenuse = 16. What is $\cos \theta$?

- A) 1.20
- B) 0.75
- C) 0.50
- D) 0.75

Q42. What is $\sin(180^\circ)$?

- A) 0
- B) 0.5
- C) 0
- D) 0.866

Q43. A ladder 7.0 m long makes an angle of 60° with the ground. How high does it reach? ($\sin 60^\circ \approx 0.866$)

- A) 5.20 m
- B) 3.46 m
- C) 6.06 m
- D) 2.00 m

Q44. What is $\tan(-45^\circ)$?

- A) 0.866
- B) 0.5
- C) -1
- D) $\sqrt{3}$

Q45. An aircraft is at 4,200 ft altitude and 11,000 ft from the runway along the glide path. What is $\sin$ of the glide angle?

- A) 0.40
- B) 0.60
- C) 0.38
- D) 0.20

SECTION 10: Complex Operations

Q46. Calculate: $(220 \times 0.4) \div (16 \times 2)$.

- A) 2.0
- B) 2.8
- C) 1.5
- D) 3.0

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Q47. A pilot works 13 h 45 min, 12 h 30 min and 8 h 45 min. What is the total?

- A) 26 h 15 min
- B) 22 h 00 min
- C) 35 h 00 min
- D) 24 h 30 min

Q48. An aircraft burns 2,000 kg/h. How much fuel is used in 4.00 h?

- A) 3,200 kg
- B) 8,000 kg
- C) 6,000 kg
- D) 4,800 kg

SECTION 11: Word Problems

Q49. A flight is delayed by 60 minutes. If the scheduled arrival was 14:10, what is the new arrival time?

- A) 14:35
- B) 15:00
- C) 15:10
- D) 15:10

Q50. A team of 11 technicians can inspect an aircraft in 48 minutes. At the same rate, how long would 13 technicians take?

- A) 36.0 min
- B) 40.6 min
- C) 60.0 min
- D) 24.0 min

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ANSWER KEY & EXPLANATIONS

SECTION 1: Fractions & Percentages

- Q1. Correct answer: C) 6,960 L — The calculation gives 6,960 L.
- Q2. Correct answer: C) 64.3% — The calculation gives 64.3%.
- Q3. Correct answer: B) AED 46,330 — The calculation gives AED 46,330.
- Q4. Correct answer: A) 11/15 — The calculation gives 11/15.
- Q5. Correct answer: B) 215 — The calculation gives 215.

SECTION 2: Speed, Distance & Time

- Q6. Correct answer: C) 2700 NM — The calculation gives 2700 NM.
- Q7. Correct answer: D) 390 km/h — The calculation gives 390 km/h.
- Q8. Correct answer: B) 648.2 km/h — The calculation gives 648.2 km/h.
- Q9. Correct answer: D) 7.2 h — The calculation gives 7.2 h.
- Q10. Correct answer: D) 18 min — The calculation gives 18 min.

SECTION 3: Ratios & Scales

- Q11. Correct answer: D) 66 km — The calculation gives 66 km.
- Q12. Correct answer: A) 6 L — The calculation gives 6 L.

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Q13. Correct answer: C) AED 5,600 — The calculation gives AED 5,600.

Q14. Correct answer: A) 21 aircraft — The calculation gives 21 aircraft.

Q15. Correct answer: A) 1:50,000 — The calculation gives 1:50,000.

SECTION 4: Unit Conversions

Q16. Correct answer: D) 6400.8 m — The calculation gives 6400.8 m.

Q17. Correct answer: C) 176,400 lb — The calculation gives 176,400 lb.

Q18. Correct answer: B) 230°F — The calculation gives 230°F.

Q19. Correct answer: D) 7,620.5 kg — The calculation gives 7,620.5 kg.

Q20. Correct answer: A) 2,037 m — The calculation gives 2,037 m.

SECTION 5: Powers, Roots & Surds

Q21. Correct answer: C) 2048 — The calculation gives 2048.

Q22. Correct answer: C) 16 — The calculation gives 16.

Q23. Correct answer: A) 32 — The calculation gives 32.

Q24. Correct answer: D) 4096 — The calculation gives 4096.

Q25. Correct answer: D) 0.028 — The calculation gives 0.028.

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SECTION 6: Areas, Volumes & Spaces

- Q26. Correct answer: B) $7,200 \text{ m}^2$ — The calculation gives $7,200 \text{ m}^2$.
- Q27. Correct answer: D) 502.40 m^3 — The calculation gives 502.40 m^3 .
- Q28. Correct answer: B) 49.5 m^2 — The calculation gives 49.5 m^2 .
- Q29. Correct answer: C) 37 m — The calculation gives 37 m .
- Q30. Correct answer: C) 180.0 m^3 — The calculation gives 180.0 m^3 .

SECTION 7: Probability & Statistics

- Q31. Correct answer: A) $11/33$ — The calculation gives $11/33$.
- Q32. Correct answer: A) 81 — The calculation gives 81 .
- Q33. Correct answer: C) $1/9$ — The calculation gives $1/9$.
- Q34. Correct answer: B) 48 — The calculation gives 48 .
- Q35. Correct answer: C) 468 — The calculation gives 468 .

SECTION 8: Algebraic Equations

- Q36. Correct answer: B) $x = 16$ — The calculation gives $x = 16$.
- Q37. Correct answer: A) 149 — The calculation gives 149 .
- Q38. Correct answer: C) $(x - 10)(x + 10)$ — The calculation gives $(x - 10)(x + 10)$.

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Q39. Correct answer: B) $x = 20$ — The calculation gives $x = 20$.

Q40. Correct answer: D) 2 — The calculation gives 2.

SECTION 9: Trigonometry

Q41. Correct answer: B) 0.75 — The calculation gives 0.75.

Q42. Correct answer: A) 0 — The calculation gives 0.

Q43. Correct answer: C) 6.06 m — The calculation gives 6.06 m.

Q44. Correct answer: C) -1 — The calculation gives -1.

Q45. Correct answer: C) 0.38 — The calculation gives 0.38.

SECTION 10: Complex Operations

Q46. Correct answer: B) 2.8 — The calculation gives 2.8.

Q47. Correct answer: C) 35 h 00 min — The calculation gives 35 h 00 min.

Q48. Correct answer: B) 8,000 kg — The calculation gives 8,000 kg.

SECTION 11: Word Problems

Q49. Correct answer: C) 15:10 — The calculation gives 15:10.

Q50. Correct answer: B) 40.6 min — The calculation gives 40.6 min.

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