



EMIRATES AIRLINE PILOT APTITUDE TEST

MATHEMATICS — PRACTICE PAPER (Model D)

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 52% of a 11,000 L tank. How many litres are in reserve?

- A) 5,280 L
- B) 6,220 L
- C) 5,720 L
- D) 5,500 L

Q2. Express $7/(12)$ as a percentage, to 1 decimal place.

- A) 42.0%
- B) 58.3%
- C) 62.5%
- D) 37.5%

Q3. A pilot earns AED 38,000 monthly and receives a 11% increase. What is the new salary?

- A) AED 42,180
- B) AED 41,000
- C) AED 38,700
- D) AED 39,520

Q4. Simplify:

$$\frac{8}{\{13\}} + \frac{1}{\{13\}}$$

- A) $8/14$
- B) $9/22$
- C) $1/13$
- D) $9/13$

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Q5. A flight carries 288 passengers. 29% are in business class. How many are in economy?

- A) 83
- B) 263
- C) 190
- D) 204

SECTION 2: Speed, Distance & Time

Q6. An aircraft travels at 500 knots for 4 hours 0 minutes. What distance does it cover?

- A) 1,500 NM
- B) 1,200 NM
- C) 2000 NM
- D) 960 NM

Q7. A jet covers 1,700 km in 4.0 hours. What is its average speed?

- A) 425 km/h
- B) 750 km/h
- C) 450 km/h
- D) 600 km/h

Q8. Convert 300 knots to km/h. (1 knot = 1.852 km/h)

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

Q9. A flight route is 5,600 km long and the aircraft flies at 820 km/h. Estimate the flight time.

- A) 6.0 h
- B) 7.5 h
- C) 4.5 h
- D) 6.8 h

Q10. An aircraft descends from 34,800 ft at 1900 ft/min. How long does the descent take?

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

SECTION 3: Ratios & Scales

Q11. A chart has scale 1:500,000. A route measures 9 cm. What is the actual distance?

- A) 240 km
- B) 600 km
- C) 45 km
- D) 18 km

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Q12. Fuel and additive are mixed in the ratio 10:1. If 66 L of fuel are used, how much additive is needed?

- A) 12 L
- B) 7 L
- C) 5 L
- D) 8 L

Q13. A bonus of AED 11,400 is shared in the ratio 2:3:4. What is the largest share?

- A) AED 5,066
- B) AED 4,000
- C) AED 3,000
- D) AED 2,000

Q14. 8 engineers service 16 aircraft in 3 days. At the same rate, how many aircraft can 10 engineers service?

- A) 20 aircraft
- B) 24 aircraft
- C) 18 aircraft
- D) 30 aircraft

Q15. A runway is 8 cm on a map and 4.0 km in reality. What is the map scale?

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

SECTION 4: Unit Conversions

Q16. Convert 18,000 ft to metres. (1 ft = 0.3048 m)

- A) 3,657.6 m
- B) 4,572.0 m
- C) 5486.4 m
- D) 6,096.0 m

Q17. Convert 70,000 kg to pounds. (1 kg = 2.205 lb)

- A) 110,250 lb
- B) 132,300 lb
- C) 154,350 lb
- D) 165,375 lb

Q18. Convert 100°C to Fahrenheit. ($F = \frac{9}{5}C + 32$)

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

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Q19. Convert 15,200 lb to kg. (1 lb = 0.4536 kg)

- A) 5,443.2 kg
- B) 6,894.7 kg
- C) 7,257.6 kg
- D) 6,350.4 kg

Q20. Convert 0.9 nautical miles to metres. (1 NM = 1,852 m)

- A) 1,852 m
- B) 926 m
- C) 1,667 m
- D) 1,389 m

SECTION 5: Powers, Roots & Surds

Q21. Calculate: $2^{\{9\}}$.

- A) 512
- B) 256
- C) 1024
- D) 2048

Q22. Simplify: $\sqrt{196}$.

- A) 16
- B) 14
- C) 12
- D) 24

Q23. Calculate: $(7)^2 - (5)^2$.

- A) 25
- B) 24
- C) 49
- D) 64

Q24. Evaluate: $((6)^2)^2$.

- A) 1296
- B) 7776
- C) 216
- D) 36

Q25. Simplify: $\sqrt{0.00060}$.

- A) 0.014
- B) 0.024
- C) 0.070
- D) 0.007

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SECTION 6: Areas, Volumes & Spaces

Q26. A rectangular hangar is 130 m long and 42 m wide. What is its area?

- A) 5,460 m²
- B) 4,800 m²
- C) 6,000 m²
- D) 3,600 m²

Q27. A cylindrical tank has radius 3.0 m and height 8 m. Find its volume ($\pi \approx 3.14$).

- A) 31.40 m³
- B) 226.08 m³
- C) 50.24 m³
- D) 78.50 m³

Q28. A triangular taxiway marking has base 9 m and height 7 m. What is its area?

- A) 20 m²
- B) 12 m²
- C) 30 m²
- D) 31.5 m²

Q29. The wingspan of an aircraft is 66 m. What is the radius of the circle swept by one wingtip?

- A) 20 m
- B) 32 m
- C) 64 m
- D) 33 m

Q30. A cargo container measures 7 m $\times$ 6 m $\times$ 2.5 m. What is its volume?

- A) 105.0 m³
- B) 20.0 m³
- C) 30.0 m³
- D) 40.0 m³

SECTION 7: Probability & Statistics

Q31. A bag contains 8 red, 9 blue and 10 green balls. Probability of blue?

- A) $\frac{9}{27}$
- B) $\frac{1}{3}$
- C) $\frac{1}{2}$
- D) $\frac{2}{5}$

Q32. The scores are 72, 79, 86, 75, 83. What is the mean?

- A) 76
- B) 79
- C) 80
- D) 72

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Q33. A die is rolled twice. Probability of getting a prime number on both rolls?

- A) $\frac{1}{2}$
- B) $\frac{1}{6}$
- C) $\frac{1}{3}$
- D) $\frac{1}{4}$

Q34. Find the range of: 16, 39, 25, 64, 32.

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

Q35. The average of 6 scores is 76. What is their total?

- A) 456
- B) 82
- C) 532
- D) 380

SECTION 8: Algebraic Equations

Q36. Solve for x: $7x - 12 = 5x + 16$.

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

Q37. If $a = 6$ and $b = -5$, evaluate: $2a^2 - 3b$.

- A) 24
- B) 30
- C) 12
- D) 87

Q38. Factorise: $x^2 - 64$.

- A) $(x - 12)(x + 2)$
- B) $(x - 8)(x + 8)$
- C) $(x - 8)^2$
- D) $(x + 8)^2$

Q39. Solve for x: $2(x + 7) = 3x - 6$.

- A) $x = 4$
- B) $x = 10$
- C) $x = 14$
- D) $x = 16$

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Q40. If $6x + 3y = 19$ and $y = 2$, find x .

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

SECTION 9: Trigonometry

Q41. In a right triangle, adjacent = 10 and hypotenuse = 14. What is $\cos \theta$?

- A) 0.71
- B) 0.50
- C) 1.20
- D) 0.75

Q42. What is $\sin(90^\circ)$?

- A) 0.5
- B) 0
- C) 1
- D) 0.866

Q43. A ladder 6.0 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) 2.00 m
- C) 3.46 m
- D) 5.20 m

Q44. What is $\tan(0^\circ)$?

- A) 0.866
- B) 0
- C) $\sqrt{3}$
- D) 0.5

Q45. An aircraft is at 3,600 ft altitude and 10,000 ft from the runway along the glide path. What is $\sin$ of the glide angle?

- A) 0.20
- B) 0.36
- C) 0.60
- D) 0.40

SECTION 10: Complex Operations

Q46. Calculate: $(180 \times 0.4) \div (14 \times 2)$.

- A) 2.0
- B) 1.5
- C) 3.0
- D) 2.6

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Q47. A pilot works 11 h 35 min, 10 h 30 min and 8 h 45 min. What is the total?

- A) 24 h 30 min
- B) 26 h 15 min
- C) 30 h 50 min
- D) 22 h 00 min

Q48. An aircraft burns 1,800 kg/h. How much fuel is used in 3.33 h?

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

SECTION 11: Word Problems

Q49. A flight is delayed by 50 minutes. If the scheduled arrival was 14:10, what is the new arrival time?

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

Q50. A team of 9 technicians can inspect an aircraft in 48 minutes. At the same rate, how long would 11 technicians take?

- A) 60.0 min
- B) 39.3 min
- C) 24.0 min
- D) 36.0 min

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ANSWER KEY & EXPLANATIONS

SECTION 1: Fractions & Percentages

- Q1. Correct answer: C) 5,720 L — The calculation gives 5,720 L.
- Q2. Correct answer: B) 58.3% — The calculation gives 58.3%.
- Q3. Correct answer: A) AED 42,180 — The calculation gives AED 42,180.
- Q4. Correct answer: D) 9/13 — The calculation gives 9/13.
- Q5. Correct answer: D) 204 — The calculation gives 204.

SECTION 2: Speed, Distance & Time

- Q6. Correct answer: C) 2000 NM — The calculation gives 2000 NM.
- Q7. Correct answer: A) 425 km/h — The calculation gives 425 km/h.
- Q8. Correct answer: C) 555.6 km/h — The calculation gives 555.6 km/h.
- Q9. Correct answer: D) 6.8 h — The calculation gives 6.8 h.
- Q10. Correct answer: B) 18 min — The calculation gives 18 min.

SECTION 3: Ratios & Scales

- Q11. Correct answer: C) 45 km — The calculation gives 45 km.
- Q12. Correct answer: B) 7 L — The calculation gives 7 L.

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Q13. Correct answer: A) AED 5,066 — The calculation gives AED 5,066.

Q14. Correct answer: A) 20 aircraft — The calculation gives 20 aircraft.

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

SECTION 4: Unit Conversions

Q16. Correct answer: C) 5486.4 m — The calculation gives 5486.4 m.

Q17. Correct answer: C) 154,350 lb — The calculation gives 154,350 lb.

Q18. Correct answer: A) 212°F — The calculation gives 212°F.

Q19. Correct answer: B) 6,894.7 kg — The calculation gives 6,894.7 kg.

Q20. Correct answer: C) 1,667 m — The calculation gives 1,667 m.

SECTION 5: Powers, Roots & Surds

Q21. Correct answer: A) 512 — The calculation gives 512.

Q22. Correct answer: B) 14 — The calculation gives 14.

Q23. Correct answer: B) 24 — The calculation gives 24.

Q24. Correct answer: A) 1296 — The calculation gives 1296.

Q25. Correct answer: B) 0.024 — The calculation gives 0.024.

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SECTION 6: Areas, Volumes & Spaces

- Q26. Correct answer: A) $5,460 \text{ m}^2$ — The calculation gives $5,460 \text{ m}^2$.
- Q27. Correct answer: B) 226.08 m^3 — The calculation gives 226.08 m^3 .
- Q28. Correct answer: D) 31.5 m^2 — The calculation gives 31.5 m^2 .
- Q29. Correct answer: D) 33 m — The calculation gives 33 m .
- Q30. Correct answer: A) 105.0 m^3 — The calculation gives 105.0 m^3 .

SECTION 7: Probability & Statistics

- Q31. Correct answer: A) $9/27$ — The calculation gives $9/27$.
- Q32. Correct answer: B) 79 — The calculation gives 79 .
- Q33. Correct answer: D) $1/4$ — The calculation gives $1/4$.
- Q34. Correct answer: B) 48 — The calculation gives 48 .
- Q35. Correct answer: A) 456 — The calculation gives 456 .

SECTION 8: Algebraic Equations

- Q36. Correct answer: B) $x = 14$ — The calculation gives $x = 14$.
- Q37. Correct answer: D) 87 — The calculation gives 87 .
- Q38. Correct answer: B) $(x - 8)(x + 8)$ — The calculation gives $(x - 8)(x + 8)$.

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Q39. Correct answer: D) $x = 16$ — The calculation gives $x = 16$.

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

SECTION 9: Trigonometry

Q41. Correct answer: A) 0.71 — The calculation gives 0.71.

Q42. Correct answer: C) 1 — The calculation gives 1.

Q43. Correct answer: A) 5.20 m — The calculation gives 5.20 m.

Q44. Correct answer: B) 0 — The calculation gives 0.

Q45. Correct answer: B) 0.36 — The calculation gives 0.36.

SECTION 10: Complex Operations

Q46. Correct answer: D) 2.6 — The calculation gives 2.6.

Q47. Correct answer: C) 30 h 50 min — The calculation gives 30 h 50 min.

Q48. Correct answer: C) 6,000 kg — The calculation gives 6,000 kg.

SECTION 11: Word Problems

Q49. Correct answer: B) 15:00 — The calculation gives 15:00.

Q50. Correct answer: B) 39.3 min — The calculation gives 39.3 min.

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