



EMIRATES AIRLINE PILOT APTITUDE

TEST

MATHEMATICS — PRACTICE PAPER (Model A)

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 43% of a 9,500 L tank. How many litres are in reserve?

- A) 5,415 L
- B) 4,585 L
- C) 4,750 L
- D) 4,085 L

Q2. Express $\frac{4}{9}$ as a percentage, to 1 decimal place.

- A) 42.0%
- B) 37.5%
- C) 44.4%
- D) 62.5%

Q3. A pilot earns AED 33,500 monthly and receives a 8% increase. What is the new salary?

- A) AED 36,180
- B) AED 33,835
- C) AED 36,500
- D) AED 34,200

Q4. Simplify:

$$\frac{5}{\{10\}} + \frac{1}{\{10\}}$$

- A) $\frac{6}{19}$
- B) $\frac{3}{5}$
- C) $\frac{1}{10}$
- D) $\frac{5}{11}$

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Q5. A flight carries 252 passengers. 26% are in business class. How many are in economy?

- A) 173
- B) 65
- C) 227
- D) 186

SECTION 2: Speed, Distance & Time

Q6. An aircraft travels at 440 knots for 2 hours 30 minutes. What distance does it cover?

- A) 1,500 NM
- B) 1100 NM
- C) 1,200 NM
- D) 960 NM

Q7. A jet covers 1,325 km in 2.5 hours. What is its average speed?

- A) 450 km/h
- B) 750 km/h
- C) 600 km/h
- D) 530 km/h

Q8. Convert 225 knots to km/h. (1 knot = 1.852 km/h)

- A) 370.4 km/h
- B) 416.7 km/h
- C) 463.0 km/h
- D) 555.6 km/h

Q9. A flight route is 4,550 km long and the aircraft flies at 730 km/h. Estimate the flight time.

- A) 7.5 h
- B) 6.0 h
- C) 4.5 h
- D) 6.2 h

Q10. An aircraft descends from 31,200 ft at 1600 ft/min. How long does the descent take?

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

SECTION 3: Ratios & Scales

Q11. A chart has scale 1:350,000. A route measures 6 cm. What is the actual distance?

- A) 600 km
- B) 240 km
- C) 18 km
- D) 21 km

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Q12. Fuel and additive are mixed in the ratio 7:1. If 48 L of fuel are used, how much additive is needed?

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

Q13. A bonus of AED 9,600 is shared in the ratio 2:3:4. What is the largest share?

- A) AED 4,000
- B) AED 3,000
- C) AED 4,266
- D) AED 2,000

Q14. 5 engineers service 13 aircraft in 3 days. At the same rate, how many aircraft can 7 engineers service?

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

Q15. A runway is 5 cm on a map and 2.5 km in reality. What is the map scale?

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

SECTION 4: Unit Conversions

Q16. Convert 13,500 ft to metres. (1 ft = 0.3048 m)

- A) 6,096.0 m
- B) 4114.8 m
- C) 4,572.0 m
- D) 3,657.6 m

Q17. Convert 55,000 kg to pounds. (1 kg = 2.205 lb)

- A) 165,375 lb
- B) 132,300 lb
- C) 110,250 lb
- D) 121,275 lb

Q18. Convert 85°C to Fahrenheit. ($F = \frac{9}{5}C + 32$)

- A) 212°F
- B) 248°F
- C) 185°F
- D) 176°F

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Q19. Convert 12,800 lb to kg. (1 lb = 0.4536 kg)

- A) 7,257.6 kg
- B) 6,350.4 kg
- C) 5,806.1 kg
- D) 5,443.2 kg

Q20. Convert 0.6 nautical miles to metres. (1 NM = 1,852 m)

- A) 1,111 m
- B) 1,852 m
- C) 1,389 m
- D) 926 m

SECTION 5: Powers, Roots & Surds

Q21. Calculate: $2^{\{6\}}$.

- A) 128
- B) 32
- C) 64
- D) 256

Q22. Simplify: $\sqrt{121}$.

- A) 9
- B) 21
- C) 13
- D) 11

Q23. Calculate: $(4)^2 - (2)^2$.

- A) 4
- B) 25
- C) 12
- D) 16

Q24. Evaluate: $((3)^2)^2$.

- A) 9
- B) 81
- C) 27
- D) 243

Q25. Simplify: $\sqrt{0.00030}$.

- A) 0.007
- B) 0.014
- C) 0.070
- D) 0.017

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SECTION 6: Areas, Volumes & Spaces

Q26. A rectangular hangar is 100 m long and 33 m wide. What is its area?

- A) 4,800 m²
- B) 3,600 m²
- C) 3,300 m²
- D) 6,000 m²

Q27. A cylindrical tank has radius 1.5 m and height 5 m. Find its volume ($\pi \approx 3.14$).

- A) 50.24 m³
- B) 31.40 m³
- C) 78.50 m³
- D) 35.33 m³

Q28. A triangular taxiway marking has base 6 m and height 4 m. What is its area?

- A) 30 m²
- B) 12.0 m²
- C) 12 m²
- D) 20 m²

Q29. The wingspan of an aircraft is 54 m. What is the radius of the circle swept by one wingtip?

- A) 27 m
- B) 32 m
- C) 20 m
- D) 64 m

Q30. A cargo container measures 4 m × 3 m × 2.5 m. What is its volume?

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

SECTION 7: Probability & Statistics

Q31. A bag contains 5 red, 6 blue and 7 green balls. Probability of blue?

- A) 1/3
- B) 6/18
- C) 1/2
- D) 2/5

Q32. The scores are 69, 76, 83, 72, 80. What is the mean?

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

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Q33. A die is rolled twice. Probability of getting an even number on both rolls?

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

Q34. Find the range of: 13, 36, 22, 61, 29.

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

Q35. The average of 6 scores is 73. What is their total?

- A) 365
- B) 511
- C) 79
- D) 438

SECTION 8: Algebraic Equations

Q36. Solve for x: $4x - 9 = 2x + 13$.

- A) $x = 6$
- B) $x = 10$
- C) $x = 14$
- D) $x = 11$

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

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

Q38. Factorise: $x^2 - 25$.

- A) $(x - 5)^2$
- B) $(x - 5)(x + 5)$
- C) $(x + 5)^2$
- D) $(x - 9)(x + 2)$

Q39. Solve for x: $2(x + 4) = 3x - 3$.

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

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Q40. If $3x + 3y = 16$ and $y = 2$, find x .

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

SECTION 9: Trigonometry

Q41. In a right triangle, adjacent = 7 and hypotenuse = 11. What is $\cos \theta$?

- A) 0.75
- B) 0.50
- C) 1.20
- D) 0.64

Q42. What is $\sin(30^\circ)$?

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

Q43. A ladder 4.5 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) 3.90 m
- D) 2.00 m

Q44. What is $\tan(30^\circ)$?

- A) 0.577
- B) $\sqrt{3}$
- C) 0.5
- D) 0.866

Q45. An aircraft is at 2,700 ft altitude and 8,500 ft from the runway along the glide path. What is $\sin$ of the glide angle?

- A) 0.20
- B) 0.32
- C) 0.40
- D) 0.60

SECTION 10: Complex Operations

Q46. Calculate: $(120 \times 0.4) \div (11 \times 2)$.

- A) 2.0
- B) 1.5
- C) 2.2
- D) 3.0

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Q47. A pilot works 8 h 20 min, 7 h 30 min and 8 h 45 min. What is the total?

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

Q48. An aircraft burns 1,500 kg/h. How much fuel is used in 2.33 h?

- A) 4,800 kg
- B) 3,200 kg
- C) 6,000 kg
- D) 3,500 kg

SECTION 11: Word Problems

Q49. A flight is delayed by 35 minutes. If the scheduled arrival was 14:10, what is the new arrival time?

- A) 14:45
- B) 15:00
- C) 15:10
- D) 14:35

Q50. A team of 6 technicians can inspect an aircraft in 48 minutes. At the same rate, how long would 8 technicians take?

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

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ANSWER KEY & EXPLANATIONS

SECTION 1: Fractions & Percentages

- Q1. Correct answer: D) 4,085 L — The calculation gives 4,085 L.
- Q2. Correct answer: C) 44.4% — The calculation gives 44.4%.
- Q3. Correct answer: A) AED 36,180 — The calculation gives AED 36,180.
- Q4. Correct answer: B) $\frac{3}{5}$ — The calculation gives $\frac{3}{5}$.
- Q5. Correct answer: D) 186 — The calculation gives 186.

SECTION 2: Speed, Distance & Time

- Q6. Correct answer: B) 1100 NM — The calculation gives 1100 NM.
- Q7. Correct answer: D) 530 km/h — The calculation gives 530 km/h.
- Q8. Correct answer: B) 416.7 km/h — The calculation gives 416.7 km/h.
- Q9. Correct answer: D) 6.2 h — The calculation gives 6.2 h.
- Q10. Correct answer: C) 20 min — The calculation gives 20 min.

SECTION 3: Ratios & Scales

- Q11. Correct answer: D) 21 km — The calculation gives 21 km.
- Q12. Correct answer: B) 7 L — The calculation gives 7 L.

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Q13. Correct answer: C) AED 4,266 — The calculation gives AED 4,266.

Q14. Correct answer: C) 18 aircraft — The calculation gives 18 aircraft.

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

SECTION 4: Unit Conversions

Q16. Correct answer: B) 4114.8 m — The calculation gives 4114.8 m.

Q17. Correct answer: D) 121,275 lb — The calculation gives 121,275 lb.

Q18. Correct answer: C) 185°F — The calculation gives 185°F.

Q19. Correct answer: C) 5,806.1 kg — The calculation gives 5,806.1 kg.

Q20. Correct answer: A) 1,111 m — The calculation gives 1,111 m.

SECTION 5: Powers, Roots & Surds

Q21. Correct answer: C) 64 — The calculation gives 64.

Q22. Correct answer: D) 11 — The calculation gives 11.

Q23. Correct answer: C) 12 — The calculation gives 12.

Q24. Correct answer: B) 81 — The calculation gives 81.

Q25. Correct answer: D) 0.017 — The calculation gives 0.017.

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SECTION 6: Areas, Volumes & Spaces

Q26. Correct answer: C) $3,300 \text{ m}^2$ — The calculation gives $3,300 \text{ m}^2$.

Q27. Correct answer: D) 35.33 m^3 — The calculation gives 35.33 m^3 .

Q28. Correct answer: B) 12.0 m^2 — The calculation gives 12.0 m^2 .

Q29. Correct answer: A) 27 m — The calculation gives 27 m .

Q30. Correct answer: A) 30.0 m^3 — The calculation gives 30.0 m^3 .

SECTION 7: Probability & Statistics

Q31. Correct answer: B) $6/18$ — The calculation gives $6/18$.

Q32. Correct answer: A) 76 — The calculation gives 76 .

Q33. Correct answer: C) $1/4$ — The calculation gives $1/4$.

Q34. Correct answer: A) 48 — The calculation gives 48 .

Q35. Correct answer: D) 438 — The calculation gives 438 .

SECTION 8: Algebraic Equations

Q36. Correct answer: D) $x = 11$ — The calculation gives $x = 11$.

Q37. Correct answer: A) 24 — The calculation gives 24 .

Q38. Correct answer: B) $(x - 5)(x + 5)$ — The calculation gives $(x - 5)(x + 5)$.

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Q39. Correct answer: B) $x = 10$ — The calculation gives $x = 10$.

Q40. Correct answer: B) 3 — The calculation gives 3.

SECTION 9: Trigonometry

Q41. Correct answer: D) 0.64 — The calculation gives 0.64.

Q42. Correct answer: A) 0.5 — The calculation gives 0.5.

Q43. Correct answer: C) 3.90 m — The calculation gives 3.90 m.

Q44. Correct answer: A) 0.577 — The calculation gives 0.577.

Q45. Correct answer: B) 0.32 — The calculation gives 0.32.

SECTION 10: Complex Operations

Q46. Correct answer: C) 2.2 — The calculation gives 2.2.

Q47. Correct answer: A) 24 h 35 min — The calculation gives 24 h 35 min.

Q48. Correct answer: D) 3,500 kg — The calculation gives 3,500 kg.

SECTION 11: Word Problems

Q49. Correct answer: A) 14:45 — The calculation gives 14:45.

Q50. Correct answer: A) 36.0 min — The calculation gives 36.0 min.

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