



EMIRATES AIRLINE PILOT APTITUDE TEST

MATHEMATICS — PRACTICE PAPER (Model B)

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 46% of a 10,000 L tank. How many litres are in reserve?

- A) 5,400 L
- B) 5,100 L
- C) 4,600 L
- D) 5,000 L

Q2. Express $\frac{5}{10}$ as a percentage, to 1 decimal place.

- A) 50.0%
- B) 42.0%
- C) 62.5%
- D) 37.5%

Q3. A pilot earns AED 35,000 monthly and receives a 9% increase. What is the new salary?

- A) AED 38,000
- B) AED 38,150
- C) AED 35,700
- D) AED 35,700

Q4. Simplify:

$$\frac{6}{\{11\}} + \frac{1}{\{11\}}$$

- A) $\frac{6}{12}$
- B) $\frac{7}{11}$
- C) $\frac{1}{11}$
- D) $\frac{7}{20}$

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Q5. A flight carries 264 passengers. 27% are in business class. How many are in economy?

- A) 179
- B) 239
- C) 192
- D) 71

SECTION 2: Speed, Distance & Time

Q6. An aircraft travels at 460 knots for 3 hours 0 minutes. What distance does it cover?

- A) 960 NM
- B) 1,200 NM
- C) 1380 NM
- D) 1,500 NM

Q7. A jet covers 1,450 km in 3.0 hours. What is its average speed?

- A) 483 km/h
- B) 600 km/h
- C) 750 km/h
- D) 450 km/h

Q8. Convert 250 knots to km/h. (1 knot = 1.852 km/h)

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

Q9. A flight route is 4,900 km long and the aircraft flies at 760 km/h. Estimate the flight time.

- A) 4.5 h
- B) 6.4 h
- C) 7.5 h
- D) 6.0 h

Q10. An aircraft descends from 32,400 ft at 1700 ft/min. How long does the descent take?

- A) 20 min
- B) 30 min
- C) 15 min
- D) 19 min

SECTION 3: Ratios & Scales

Q11. A chart has scale 1:400,000. A route measures 7 cm. What is the actual distance?

- A) 600 km
- B) 240 km
- C) 18 km
- D) 28 km

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Q12. Fuel and additive are mixed in the ratio 8:1. If 54 L of fuel are used, how much additive is needed?

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

Q13. A bonus of AED 10,200 is shared in the ratio 2:3:4. What is the largest share?

- A) AED 3,000
- B) AED 4,000
- C) AED 2,000
- D) AED 4,533

Q14. 6 engineers service 14 aircraft in 3 days. At the same rate, how many aircraft can 8 engineers service?

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

Q15. A runway is 6 cm on a map and 3.0 km in reality. What is the map scale?

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

SECTION 4: Unit Conversions

Q16. Convert 15,000 ft to metres. (1 ft = 0.3048 m)

- A) 4,572.0 m
- B) 3,657.6 m
- C) 4572.0 m
- D) 6,096.0 m

Q17. Convert 60,000 kg to pounds. (1 kg = 2.205 lb)

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

Q18. Convert 90°C to Fahrenheit. ($F = \frac{9}{5}C + 32$)

- A) 248°F
- B) 212°F
- C) 194°F
- D) 176°F

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Q19. Convert 13,600 lb to kg. (1 lb = 0.4536 kg)

- A) 5,443.2 kg
- B) 6,350.4 kg
- C) 7,257.6 kg
- D) 6,169.0 kg

Q20. Convert 0.7 nautical miles to metres. (1 NM = 1,852 m)

- A) 926 m
- B) 1,389 m
- C) 1,852 m
- D) 1,296 m

SECTION 5: Powers, Roots & Surds

Q21. Calculate: $2^{\{7\}}$.

- A) 128
- B) 256
- C) 512
- D) 64

Q22. Simplify: $\sqrt{144}$.

- A) 14
- B) 12
- C) 10
- D) 22

Q23. Calculate: $(5)^2 - (3)^2$.

- A) 36
- B) 25
- C) 16
- D) 9

Q24. Evaluate: $((4)^2)^2$.

- A) 16
- B) 64
- C) 1024
- D) 256

Q25. Simplify: $\sqrt{0.00040}$.

- A) 0.070
- B) 0.014
- C) 0.020
- D) 0.007

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SECTION 6: Areas, Volumes & Spaces

Q26. A rectangular hangar is 110 m long and 36 m wide. What is its area?

- A) 3,960 m²
- B) 3,600 m²
- C) 6,000 m²
- D) 4,800 m²

Q27. A cylindrical tank has radius 2.0 m and height 6 m. Find its volume ($\pi \approx 3.14$).

- A) 50.24 m³
- B) 31.40 m³
- C) 75.36 m³
- D) 78.50 m³

Q28. A triangular taxiway marking has base 7 m and height 5 m. What is its area?

- A) 12 m²
- B) 17.5 m²
- C) 30 m²
- D) 20 m²

Q29. The wingspan of an aircraft is 58 m. What is the radius of the circle swept by one wingtip?

- A) 64 m
- B) 32 m
- C) 20 m
- D) 29 m

Q30. A cargo container measures 5 m × 4 m × 2.5 m. What is its volume?

- A) 30.0 m³
- B) 40.0 m³
- C) 20.0 m³
- D) 50.0 m³

SECTION 7: Probability & Statistics

Q31. A bag contains 6 red, 7 blue and 8 green balls. Probability of blue?

- A) $\frac{1}{2}$
- B) $\frac{1}{3}$
- C) $\frac{2}{5}$
- D) $\frac{7}{21}$

Q32. The scores are 70, 77, 84, 73, 81. What is the mean?

- A) 72
- B) 76
- C) 80
- D) 77

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

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

Q34. Find the range of: 14, 37, 23, 62, 30.

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

Q35. The average of 6 scores is 74. What is their total?

- A) 370
- B) 444
- C) 518
- D) 80

SECTION 8: Algebraic Equations

Q36. Solve for x: $5x - 10 = 3x + 14$.

- A) $x = 10$
- B) $x = 12$
- C) $x = 14$
- D) $x = 6$

Q37. If $a = 4$ and $b = -3$, evaluate: $2a^2 - 3b$.

- A) 30
- B) 24
- C) 12
- D) 41

Q38. Factorise: $x^2 - 36$.

- A) $(x - 10)(x + 2)$
- B) $(x - 6)^2$
- C) $(x + 6)^2$
- D) $(x - 6)(x + 6)$

Q39. Solve for x: $2(x + 5) = 3x - 4$.

- A) $x = 12$
- B) $x = 14$
- C) $x = 4$
- D) $x = 10$

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Q40. If $4x + 3y = 17$ and $y = 2$, find x .

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

SECTION 9: Trigonometry

Q41. In a right triangle, adjacent = 8 and hypotenuse = 12. What is $\cos \theta$?

- A) 1.20
- B) 0.50
- C) 0.67
- D) 0.75

Q42. What is $\sin(45^\circ)$?

- A) 0.5
- B) 0.866
- C) 0
- D) 0.707

Q43. A ladder 5.0 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) 4.33 m
- D) 2.00 m

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

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

Q45. An aircraft is at 3,000 ft altitude and 9,000 ft from the runway along the glide path. What is $\sin$ of the glide angle?

- A) 0.60
- B) 0.33
- C) 0.20
- D) 0.40

SECTION 10: Complex Operations

Q46. Calculate: $(140 \times 0.4) \div (12 \times 2)$.

- A) 3.0
- B) 1.5
- C) 2.0
- D) 2.3

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Q47. A pilot works 9 h 25 min, 8 h 30 min and 8 h 45 min. What is the total?

- A) 26 h 15 min
- B) 22 h 00 min
- C) 24 h 30 min
- D) 26 h 40 min

Q48. An aircraft burns 1,600 kg/h. How much fuel is used in 2.67 h?

- A) 6,000 kg
- B) 4,800 kg
- C) 4,267 kg
- D) 3,200 kg

SECTION 11: Word Problems

Q49. A flight is delayed by 40 minutes. If the scheduled arrival was 14:10, what is the new arrival time?

- A) 14:35
- B) 15:00
- C) 15:10
- D) 14:50

Q50. A team of 7 technicians can inspect an aircraft in 48 minutes. At the same rate, how long would 9 technicians take?

- A) 37.3 min
- B) 60.0 min
- C) 24.0 min
- D) 36.0 min

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ANSWER KEY & EXPLANATIONS

SECTION 1: Fractions & Percentages

- Q1. Correct answer: C) 4,600 L — The calculation gives 4,600 L.
- Q2. Correct answer: A) 50.0% — The calculation gives 50.0%.
- Q3. Correct answer: B) AED 38,150 — The calculation gives AED 38,150.
- Q4. Correct answer: B) 7/11 — The calculation gives 7/11.
- Q5. Correct answer: C) 192 — The calculation gives 192.

SECTION 2: Speed, Distance & Time

- Q6. Correct answer: C) 1380 NM — The calculation gives 1380 NM.
- Q7. Correct answer: A) 483 km/h — The calculation gives 483 km/h.
- Q8. Correct answer: C) 463.0 km/h — The calculation gives 463.0 km/h.
- Q9. Correct answer: B) 6.4 h — The calculation gives 6.4 h.
- Q10. Correct answer: D) 19 min — The calculation gives 19 min.

SECTION 3: Ratios & Scales

- Q11. Correct answer: D) 28 km — The calculation gives 28 km.
- Q12. Correct answer: A) 7 L — The calculation gives 7 L.

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Q13. Correct answer: D) AED 4,533 — The calculation gives AED 4,533.

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: C) 4572.0 m — The calculation gives 4572.0 m.

Q17. Correct answer: C) 132,300 lb — The calculation gives 132,300 lb.

Q18. Correct answer: C) 194°F — The calculation gives 194°F.

Q19. Correct answer: D) 6,169.0 kg — The calculation gives 6,169.0 kg.

Q20. Correct answer: D) 1,296 m — The calculation gives 1,296 m.

SECTION 5: Powers, Roots & Surds

Q21. Correct answer: A) 128 — The calculation gives 128.

Q22. Correct answer: B) 12 — The calculation gives 12.

Q23. Correct answer: C) 16 — The calculation gives 16.

Q24. Correct answer: D) 256 — The calculation gives 256.

Q25. Correct answer: C) 0.020 — The calculation gives 0.020.

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SECTION 6: Areas, Volumes & Spaces

Q26. Correct answer: A) $3,960 \text{ m}^2$ — The calculation gives $3,960 \text{ m}^2$.

Q27. Correct answer: C) 75.36 m^3 — The calculation gives 75.36 m^3 .

Q28. Correct answer: B) 17.5 m^2 — The calculation gives 17.5 m^2 .

Q29. Correct answer: D) 29 m — The calculation gives 29 m .

Q30. Correct answer: D) 50.0 m^3 — The calculation gives 50.0 m^3 .

SECTION 7: Probability & Statistics

Q31. Correct answer: D) $7/21$ — The calculation gives $7/21$.

Q32. Correct answer: D) 77 — The calculation gives 77 .

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

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

Q35. Correct answer: B) 444 — The calculation gives 444 .

SECTION 8: Algebraic Equations

Q36. Correct answer: B) $x = 12$ — The calculation gives $x = 12$.

Q37. Correct answer: D) 41 — The calculation gives 41 .

Q38. Correct answer: D) $(x - 6)(x + 6)$ — The calculation gives $(x - 6)(x + 6)$.

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Q39. Correct answer: A) $x = 12$ — The calculation gives $x = 12$.

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

SECTION 9: Trigonometry

Q41. Correct answer: C) 0.67 — The calculation gives 0.67.

Q42. Correct answer: D) 0.707 — The calculation gives 0.707.

Q43. Correct answer: C) 4.33 m — The calculation gives 4.33 m.

Q44. Correct answer: A) 1 — The calculation gives 1.

Q45. Correct answer: B) 0.33 — The calculation gives 0.33.

SECTION 10: Complex Operations

Q46. Correct answer: D) 2.3 — The calculation gives 2.3.

Q47. Correct answer: D) 26 h 40 min — The calculation gives 26 h 40 min.

Q48. Correct answer: C) 4,267 kg — The calculation gives 4,267 kg.

SECTION 11: Word Problems

Q49. Correct answer: D) 14:50 — The calculation gives 14:50.

Q50. Correct answer: A) 37.3 min — The calculation gives 37.3 min.

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