



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 the 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 cargo hold is 65% full. If the total capacity is 12,000 kg, how much more cargo can be loaded?

- A) 4,200 kg
- B) 7,800 kg
- C) 3,600 kg
- D) 4,500 kg

Q2. Simplify: $\frac{5}{8} - \frac{1}{3}$

- A) $\frac{4}{5}$
- B) $\frac{7}{24}$
- C) $\frac{11}{24}$
- D) $\frac{1}{2}$

Q3. A ticket costs AED 1,250. After a 15% discount, what is the price?

- A) AED 1,062.50
- B) AED 1,087.50
- C) AED 1,100
- D) AED 1,050

Q4. Express 0.045 as a percentage.

- A) 45%
- B) 4.5%
- C) 0.45%
- D) 450%

Q5. If $\frac{3}{5}$ of a fuel tank is 900 liters, what is the full capacity?

- A) 1,200 L
- B) 1,500 L
- C) 1,800 L
- D) 2,100 L

SECTION 2: Speed, Distance & Time

Q6. An aircraft flies 1,500 NM at 450 knots. How long is the flight?

- A) 3h 10min
- B) 3h 20min
- C) 3h 30min
- D) 3h 40min

Q7. A plane covers 400 km in 45 minutes. What is its speed in km/h?

- A) 500 km/h
- B) 533 km/h
- C) 560 km/h
- D) 600 km/h

Q8. Convert 600 km/h to knots. (1 knot = 1.852 km/h)

- A) 324 knots
- B) 350 knots
- C) 310 knots
- D) 340 knots

Q9. A pilot flies for 4 hours at 520 km/h and then 2 hours at 480 km/h. What is the average speed?

- A) 500 km/h
- B) 506.7 km/h
- C) 510 km/h
- D) 515 km/h

Q10. An aircraft climbs 12,000 ft in 8 minutes. What is the rate of climb in ft/min?

- A) 1,200 ft/min
- B) 1,500 ft/min
- C) 1,800 ft/min
- D) 2,000 ft/min

SECTION 3: Ratios & Scales

Q11. On a map with scale 1:250,000, two cities are 12 cm apart. What is the actual distance?

- A) 30 km
- B) 300 km
- C) 3 km
- D) 3,000 km

Q12. Divide AED 4,500 in the ratio 4:5.

- A) 2,000 and 2,500
- B) 1,800 and 2,700
- C) 1,500 and 3,000
- D) 2,200 and 2,300

Q13. If 4 pumps can empty a tank in 6 hours, how long will 6 pumps take?

- A) 3 hours
- B) 4 hours
- C) 5 hours
- D) 9 hours

Q14. A recipe for fuel mixture is 20:1 (Fuel:Additive). How much additive is needed for 500 L of fuel?

- A) 20 L
- B) 25 L
- C) 30 L
- D) 50 L

Q15. The ratio of captains to first officers is 2:7. If there are 18 captains, how many first officers are there?

- A) 56
- B) 63
- C) 70
- D) 81



SECTION 4: Unit Conversions

Q16. Convert 45,000 lbs to kg. (1 lb = 0.4536 kg)

- A) 20,412 kg
- B) 21,500 kg
- C) 19,800 kg
- D) 22,000 kg

Q17. Convert 250 miles to kilometers. (1 mile = 1.609 km)

- A) 380.5 km
- B) 402.25 km
- C) 415.5 km
- D) 420 km

Q18. Convert 85°F to Celsius. ($C = (F - 32) * 5/9$)

- A) 25.5°C
- B) 29.4°C
- C) 32.2°C
- D) 35.0°C

Q19. Convert 10,000 meters to nautical miles. (1 NM = 1,852 m)

- A) 5.0 NM
- B) 5.4 NM
- C) 5.8 NM
- D) 6.2 NM

Q20. A volume of 50 US gallons is how many liters? (1 US gal = 3.785 L)

- A) 185.5 L
- B) 189.25 L
- C) 192.0 L
- D) 200.5 L

SECTION 5: Powers, Roots & Surds

Q21. Calculate: 3^4

- A) 27
- B) 64
- C) 81
- D) 128

Q22. Simplify: $\sqrt{625}$

- A) 15
- B) 25
- C) 35
- D) 45

Q23. What is $4^3 + 2^5$?

- A) 96
- B) 100
- C) 112
- D) 128

Q24. Simplify: $\sqrt{0.0121}$

- A) 0.11
- B) 0.011
- C) 1.1
- D) 0.0121

Q25. Evaluate: $(2^3)^2$

- A) 32
- B) 64
- C) 128
- D) 16

SECTION 6: Areas, Volumes & Spaces

Q26. A square helipad has an area of 400 m^2 . What is its perimeter?

- A) 40 m
- B) 60 m
- C) 80 m
- D) 100 m

Q27. A sphere has a radius of 3 m. What is its volume? ($V = \frac{4}{3} * \pi * r^3$, π approx 3.14)

- A) 113.04 m^3
- B) 150.72 m^3
- C) 100.5 m^3
- D) 125.6 m^3

Q28. A trapezoidal wing has bases 10 m and 6 m, and height 8 m. What is its area?

- A) 48 m^2
- B) 64 m^2
- C) 80 m^2
- D) 128 m^2

Q29. A fuel truck tank is 8 m long with a cross-section area of 5 m^2 . What is its volume?

- A) 30 m^3
- B) 35 m^3
- C) 40 m^3
- D) 45 m^3



Q30. A circle has a circumference of 31.4 m. What is its radius? (π approx 3.14)

- A) 4 m
- B) 5 m
- C) 6 m
- D) 10 m

SECTION 7: Probability & Statistics

Q31. A pilot has a 95% chance of a smooth landing. In 20 landings, how many are expected to be rough?

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

Q32. Find the range of: 12, 45, 23, 67, 34, 18

- A) 45
- B) 49
- C) 55
- D) 67

Q33. A bag has 4 red, 6 blue, and 10 white chips. What is the probability of NOT picking a red chip?

- A) $1/5$
- B) $4/5$
- C) $3/4$
- D) $1/2$

Q34. The average of 4 numbers is 15. If a 5th number is added, the average becomes 18. What is the 5th number?

- A) 20
- B) 25
- C) 30
- D) 35

Q35. In a flight of 120 passengers, 15 ordered a vegetarian meal. What is the probability a random passenger did NOT order it?

- A) $1/8$
- B) $7/8$
- C) $3/4$
- D) $5/6$

SECTION 8: Algebraic Equations



Q36. Solve for y: $5y - 12 = 3y + 8$

- A) $y = 5$
- B) $y = 10$
- C) $y = 15$
- D) $y = 20$

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

- A) 12
- B) 15
- C) 24
- D) 30

Q38. Factorize: $x^2 - 16$

- A) $(x-4)(x-4)$
- B) $(x+4)(x+4)$
- C) $(x-4)(x+4)$
- D) $(x-8)(x+2)$

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

- A) $x = 10$
- B) $x = 12$
- C) $x = 14$
- D) $x = 16$

Q40. If $3x + 2y = 12$ and $y = 3$, find x .

- A) 1
- B) 2
- C) 3
- D) 4

SECTION 9: Trigonometry

Q41. In a right triangle, adjacent = 8 and hypotenuse = 10. What is $\cos \theta$?

- A) 0.6
- B) 0.8
- C) 1.25
- D) 0.75

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

- A) 0.5
- B) 0.707
- C) 0.866
- D) 1

Q43. A ladder 5 m long leans against a wall at 60° . How high does it reach? ($\sin 60^\circ$ approx 0.866)

- A) 3.5 m
- B) 4.33 m
- C) 4.5 m
- D) 2.5 m

Q44. What is $\tan 60^\circ$?

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

Q45. An aircraft is at 3,000 ft altitude and the slant distance to the runway is 10,000 ft. What is the sine of the glide angle?

- A) 0.3
- B) 0.33
- C) 0.5
- D) 0.1

SECTION 10: Complex Operations

Q46. Calculate: $(120 * 0.5) / (15 * 2)$

- A) 2
- B) 3
- C) 4
- D) 5

Q47. A pilot works 3 shifts: 8h 45min, 7h 30min, and 9h 15min. Total time?

- A) 25h 15min
- B) 25h 30min
- C) 25h 45min
- D) 26h 00min

Q48. An aircraft burns 1,800 kg/h. How much fuel in 3h 20min?

- A) 5,400 kg
- B) 5,800 kg
- C) 6,000 kg
- D) 6,200 kg

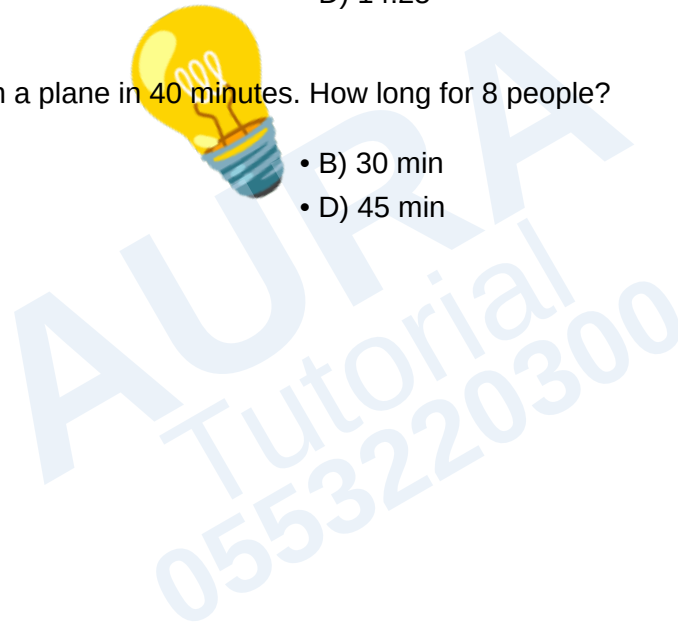
SECTION 11: Word Problems

Q49. A flight is delayed by 45 minutes. If the original arrival was 13:20, what is the new arrival?

- A) 13:55
- B) 14:05
- C) 14:15
- D) 14:25

Q50. A crew of 6 can clean a plane in 40 minutes. How long for 8 people?

- A) 20 min
- B) 30 min
- C) 35 min
- D) 45 min



ANSWER KEY & EXPLANATIONS

SECTION 1: Fractions & Percentages

Q1. ✓ Correct Answer: A) 4,200 kg

Explanation: Remaining capacity = 35% of 12,000 = $0.35 \times 12,000 = 4,200$ kg

Q2. ✓ Correct Answer: B) 7/24

Explanation: LCM(8,3)=24. $15/24 - 8/24 = 7/24$

Q3. ✓ Correct Answer: A) AED 1,062.50

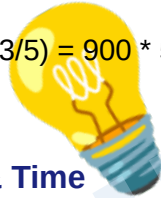
Explanation: Discount = $1,250 \times 0.15 = 187.5$. Price = $1,250 - 187.5 = 1,062.50$

Q4. ✓ Correct Answer: B) 4.5%

Explanation: $0.045 \times 100 = 4.5\%$

Q5. ✓ Correct Answer: B) 1,500 L

Explanation: Full capacity = $900 \div (3/5) = 900 \times 5/3 = 1,500$ L



SECTION 2: Speed, Distance & Time

Q6. ✓ Correct Answer: B) 3h 20min

Explanation: Time = $1,500 \div 450 = 3.33$ hours = 3h 20min

Q7. ✓ Correct Answer: B) 533 km/h

Explanation: Speed = $400 \div (45/60) = 400 \times 4/3 = 533.33$ km/h

Q8. ✓ Correct Answer: A) 324 knots

Explanation: $600 \div 1.852 = 323.97$ approx 324 knots

Q9. ✓ Correct Answer: B) 506.7 km/h

Explanation: Total dist = $(4 \times 520) + (2 \times 480) = 2080 + 960 = 3040$. Avg = $3040 \div 6 = 506.67$ km/h

Q10. ✓ Correct Answer: B) 1,500 ft/min

Explanation: $12,000 \div 8 = 1,500$ ft/min

SECTION 3: Ratios & Scales

Q11. ✓ Correct Answer: A) 30 km

Explanation: $12 \times 250,000 = 3,000,000$ cm = 30 km

Q12. ✓ Correct Answer: A) 2,000 and 2,500

Explanation: Total parts = 9. $4/9 \times 4500 = 2000$. $5/9 \times 4500 = 2500$

Q13. ✓ Correct Answer: B) 4 hours

Explanation: Total pump-hours = $4 * 6 = 24$. $24 / 6 = 4$ hours

Q14. ✓ Correct Answer: B) 25 L

Explanation: $500 / 20 = 25$ L

Q15. ✓ Correct Answer: B) 63

Explanation: 1 unit = $18/2 = 9$. 7 units = $7 * 9 = 63$

SECTION 4: Unit Conversions

Q16. ✓ Correct Answer: A) 20,412 kg

Explanation: $45,000 * 0.4536 = 20,412$ kg

Q17. ✓ Correct Answer: B) 402.25 km

Explanation: $250 * 1.609 = 402.25$ km

Q18. ✓ Correct Answer: B) 29.4°C

Explanation: $(85-32) * 5/9 = 53 * 5/9 = 29.44°C$

Q19. ✓ Correct Answer: B) 5.4 NM

Explanation: $10,000 / 1,852 = 5.399$ NM approx 5.4 NM

Q20. ✓ Correct Answer: B) 189.25 L

Explanation: $50 * 3.785 = 189.25$ L

SECTION 5: Powers, Roots & Surds

Q21. ✓ Correct Answer: C) 81

Explanation: $3 * 3 * 3 * 3 = 81$

Q22. ✓ Correct Answer: B) 25

Explanation: $25 * 25 = 625$

Q23. ✓ Correct Answer: A) 96

Explanation: $64 + 32 = 96$

Q24. ✓ Correct Answer: A) 0.11

Explanation: $0.11 * 0.11 = 0.0121$

Q25. ✓ Correct Answer: B) 64

Explanation: $8^2 = 64$

SECTION 6: Areas, Volumes & Spaces

Q26. ✓ Correct Answer: C) 80 m

Explanation: Side = $\sqrt{400} = 20$. Perimeter = $4 * 20 = 80$ m

Q27. ✓ Correct Answer: A) 113.04 m³

Explanation: $\frac{4}{3} * 3.14 * 27 = 4 * 3.14 * 9 = 113.04$ m³

Q28. ✓ Correct Answer: B) 64 m²

Explanation: Area = $0.5 * (10+6) * 8 = 8 * 8 = 64$ m²

Q29. ✓ Correct Answer: C) 40 m³

Explanation: $8 * 5 = 40$ m³

Q30. ✓ Correct Answer: B) 5 m

Explanation: $31.4 / (2 * 3.14) = 31.4 / 6.28 = 5$ m

SECTION 7: Probability & Statistics

Q31. ✓ Correct Answer: A) 1

Explanation: Rough chance = 5%. $0.05 * 20 = 1$

Q32. ✓ Correct Answer: B) 49

Explanation: Max - Min = $67 - 18 = 49$

Q33. ✓ Correct Answer: B) 4/5

Explanation: Total = 20. Not red = 16. $16/20 = 4/5$

Q34. ✓ Correct Answer: C) 30

Explanation: Total of 4 = 60. Total of 5 = 90. $90 - 60 = 30$

Q35. ✓ Correct Answer: B) 7/8

Explanation: $15/120 = 1/8$. $1 - 1/8 = 7/8$

SECTION 8: Algebraic Equations

Q36. ✓ Correct Answer: B) $y = 10$

Explanation: $2y = 20 \rightarrow y = 10$

Q37. ✓ Correct Answer: C) 24

Explanation: $2(9) - 3(-2) = 18 + 6 = 24$

Q38. ✓ Correct Answer: C) $(x-4)(x+4)$

Explanation: Difference of squares

Q39. ✓ Correct Answer: C) $x = 14$

Explanation: $2x + 10 = 3x - 4 \rightarrow x = 14$

Q40. ✓ Correct Answer: B) 2

Explanation: $3x + 6 = 12 \rightarrow 3x = 6 \rightarrow x = 2$

SECTION 9: Trigonometry

Q41. ✓ Correct Answer: B) 0.8

Explanation: $\cos = \text{adj}/\text{hyp} = 8/10 = 0.8$

Q42. ✓ Correct Answer: B) 0.707

Explanation: $\sin 45 = 1/\sqrt{2}$ approx 0.707

Q43. ✓ Correct Answer: B) 4.33 m

Explanation: height = $5 * \sin 60 = 5 * 0.866 = 4.33 \text{ m}$

Q44. ✓ Correct Answer: C) $\sqrt{3}$

Explanation: $\tan 60 = \sqrt{3}$

Q45. ✓ Correct Answer: A) 0.3

Explanation: $\sin = \text{opp}/\text{hyp} = 3,000 / 10,000 = 0.3$



SECTION 10: Complex Operations

Q46. ✓ Correct Answer: A) 2

Explanation: $60 / 30 = 2$

Q47. ✓ Correct Answer: B) 25h 30min

Explanation: $8+7+9 = 24\text{h}$. $45+30+15 = 90\text{min} = 1\text{h } 30\text{min}$. Total = 25h 30min

Q48. ✓ Correct Answer: C) 6,000 kg

Explanation: $1,800 * 3.333 = 6,000 \text{ kg}$

SECTION 11: Word Problems

Q49. ✓ Correct Answer: B) 14:05

Explanation: $13:20 + 45 \text{ min} = 14:05$

Q50. ✓ Correct Answer: B) 30 min

Explanation: $6 * 40 = 240 \text{ man-minutes}$. $240 / 8 = 30 \text{ minutes}$