



# EMIRATES AIRLINE PILOT APTITUDE TEST

## MATHEMATICS — PRACTICE PAPER (Model B)

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

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### 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 fuel tank is  $\frac{2}{5}$  full. Adding 600 liters makes it half full. Capacity?

- A) 3,000 L
- B) 6,000 L
- C) 4,500 L
- D) 5,000 L

**Q2.** Simplify:  $\frac{2}{3} * \frac{3}{4} * \frac{4}{5}$

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

**Q3.** A salary of AED 35,000 is increased by 8%. New salary?

- A) AED 37,200
- B) AED 37,800
- C) AED 38,000
- D) AED 38,500

**Q4.** What is 12.5% of 800?

- A) 80
- B) 100
- C) 120
- D) 150

**Q5.** Express  $\frac{5}{16}$  as a decimal.

- A) 0.3125
- B) 0.325
- C) 0.35
- D) 0.375

## SECTION 2: Speed, Distance & Time

**Q6.** An aircraft flies at 480 mph for 1,200 miles. How long?

- A) 2h 15min
- B) 2h 30min
- C) 2h 45min
- D) 3h 00min

**Q7.** A jet travels 900 km in 1 hour 12 minutes. Speed?

- A) 700 km/h
- B) 750 km/h
- C) 800 km/h
- D) 850 km/h

**Q8.** Convert 400 knots to mph. (1 knot approx 1.15 mph)

- A) 420 mph
- B) 440 mph
- C) 460 mph
- D) 480 mph

**Q9.** A wind speed is 30 knots. How far does the wind travel in 10 minutes?

- A) 3 NM
- B) 5 NM
- C) 6 NM
- D) 10 NM

**Q10.** A plane descends at 2,500 ft/min. How long to descend 15,000 ft?

- A) 5 min
- B) 6 min
- C) 7 min
- D) 8 min

## SECTION 3: Ratios & Scales

**Q11.** A model plane has a scale of 1:72. The wingspan is 50 cm. Actual wingspan?

- A) 30 m
- B) 36 m
- C) 40 m
- D) 42 m

**Q12.** Mix water and coolant in ratio 3:2. Total volume is 20 L. Water volume?

- A) 8 L
- B) 10 L
- C) 12 L
- D) 15 L

**Q13.** If 3 workers take 8 hours, how long for 4 workers?

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

**Q14.** The ratio of takeoff weight to landing weight is 5:4. Takeoff is 250 tons. Landing?

- A) 180 tons
- B) 200 tons
- C) 220 tons
- D) 240 tons

**Q15.** Scale 1:1,000,000. Distance on map is 5.5 cm. Actual distance?

- A) 5.5 km
- B) 55 km
- C) 550 km
- D) 5,500 km



#### **SECTION 4: Unit Conversions**

**Q16.** Convert 80,000 kg to tons.

- A) 8 tons
- B) 80 tons
- C) 800 tons
- D) 0.8 tons

**Q17.** Convert 5,000 feet to kilometers. (1 ft = 0.3048 m)

- A) 1.524 km
- B) 1.609 km
- C) 1.450 km
- D) 1.700 km

**Q18.** Convert 20°C to Kelvin. ( $K = C + 273.15$ )

- A) 253.15 K
- B) 273.15 K
- C) 293.15 K
- D) 303.15 K

**Q19.** Convert 12 NM to km. (1 NM = 1.852 km)

- A) 20.2 km
- B) 22.2 km
- C) 24.2 km
- D) 26.2 km

**Q20.** Convert 1,000 liters to cubic meters.

- A)  $0.1 \text{ m}^3$
- B)  $1 \text{ m}^3$
- C)  $10 \text{ m}^3$
- D)  $100 \text{ m}^3$

## SECTION 5: Powers, Roots & Surds

**Q21.** Calculate:  $5^4$

- A) 125
- B) 500
- C) 625
- D) 750

**Q22.** Simplify:  $\sqrt{1024}$

- A) 28
- B) 30
- C) 32
- D) 34

**Q23.** What is  $10^3 - 10^2$ ?

- A) 0
- B) 90
- C) 900
- D) 1000

**Q24.** Simplify:  $\sqrt{0.09} * \sqrt{0.16}$

- A) 0.12
- B) 0.25
- C) 0.07
- D) 0.5

**Q25.** Evaluate:  $2^2 * 2^3 * 2^4$

- A)  $2^9$
- B)  $2^{24}$
- C) 512
- D) A and C

## SECTION 6: Areas, Volumes & Spaces

**Q26.** A triangle has sides 3, 4, 5. Area?

- A) 6
- B) 10
- C) 12
- D) 7.5



**Q27.** A cylinder has radius 1 m and height 10 m. Volume? (pi approx 3.14)

- A)  $3.14 \text{ m}^3$
- B)  $31.4 \text{ m}^3$
- C)  $62.8 \text{ m}^3$
- D)  $10 \text{ m}^3$

**Q28.** A rectangle has perimeter 40 cm. Length is 12 cm. Width?

- A) 8 cm
- B) 10 cm
- C) 14 cm
- D) 28 cm

**Q29.** A cube has volume  $216 \text{ cm}^3$ . Surface area?

- A)  $36 \text{ cm}^2$
- B)  $144 \text{ cm}^2$
- C)  $216 \text{ cm}^2$
- D)  $256 \text{ cm}^2$

**Q30.** A circle has area  $78.5 \text{ m}^2$ . Diameter? (pi approx 3.14)

- A) 5 m
- B) 10 m
- C) 15 m
- D) 25 m



## SECTION 7: Probability & Statistics

**Q31.** A die is rolled. Probability of a prime number?

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

**Q32.** Median of: 5, 8, 3, 10, 2

- A) 3
- B) 5
- C) 8
- D) 5.6

**Q33.** Standard deviation of 4, 4, 4, 4?

- A) 0
- B) 1
- C) 4
- D) 16

**Q34.** A bag has 3 blue and 2 red balls. Two are picked with replacement. Probability both blue?

- A)  $6/25$
- B)  $9/25$
- C)  $1/2$
- D)  $3/5$

**Q35.** Mode of: 1, 2, 2, 3, 4, 4, 4, 5

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

## SECTION 8: Algebraic Equations

**Q36.** Solve for x:  $x/4 + 5 = 8$

- A) 4
- B) 8
- C) 12
- D) 16

**Q37.** Expand:  $(x + 3)(x - 5)$

- A)  $x^2 - 2x - 15$
- B)  $x^2 + 2x - 15$
- C)  $x^2 - 8x - 15$
- D)  $x^2 + 8x + 15$

**Q38.** If  $2x + 5 = 1$ , find x.

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

**Q39.** Solve:  $3(x - 4) = 15$

- A) 5
- B) 7
- C) 9
- D) 11

**Q40.** If  $x^2 = 49$  and  $x < 0$ ,  $x = ?$

- A) 7
- B) -7
- C) 49
- D) -49

## SECTION 9: Trigonometry

**Q41.** In a right triangle, opp = 5, adj = 12. Hypotenuse?

- A) 13
- B) 15
- C) 17
- D) 20



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**Q42.** What is  $\cos 90^\circ$ ?

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

**Q43.** A shadow of a 10 m pole is 10 m. Angle of elevation?

- A)  $30^\circ$
- B)  $45^\circ$
- C)  $60^\circ$
- D)  $90^\circ$

**Q44.**  $\sin \theta = 0.8$ . What is  $\cos \theta$ ? ( $\theta$  is acute)

- A) 0.2
- B) 0.4
- C) 0.6
- D) 0.5

**Q45.** Value of  $\sin 30^\circ + \cos 60^\circ$ ?

- A) 0.5
- B) 1
- C) 1.5
- D) 0



## SECTION 10: Complex Operations

**Q46.** Calculate: 15% of  $(200 + 400)$

- A) 60
- B) 90
- C) 120
- D) 150

**Q47.** A flight duration is 14h 50min. It leaves at 22:30. Arrival time?

- A) 12:20 next day
- B) 13:20 next day
- C) 14:20 next day
- D) 15:20 next day

**Q48.** An aircraft uses 4,000 L of fuel for a 5-hour flight. Hourly rate?

- A) 600 L/h
- B) 800 L/h
- C) 1,000 L/h
- D) 1,200 L/h

## SECTION 11: Word Problems

**Q49.** A plane has 180 seats. 10% are empty. How many passengers?

- A) 160
- B) 162
- C) 170
- D) 172

**Q50.** If a pilot earns AED 300 per hour, how much for a 75-hour month?

- A) 21,500
- B) 22,500
- C) 23,500
- D) 25,000



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# ANSWER KEY & EXPLANATIONS

## SECTION 1: Fractions & Percentages

Q1. ✓ Correct Answer: B) 6,000 L

Explanation:  $\frac{1}{2} - \frac{2}{5} = \frac{1}{10}$ .  $\frac{1}{10}$  of cap = 600  $\rightarrow$  cap = 6,000 L

Q2. ✓ Correct Answer: B)  $\frac{2}{5}$

Explanation:  $\frac{2}{5}$  after canceling 3 and 4

Q3. ✓ Correct Answer: B) 37,800

Explanation:  $35,000 * 1.08 = 37,800$

Q4. ✓ Correct Answer: B) 100

Explanation:  $800 * 0.125 = 100$

Q5. ✓ Correct Answer: A) 0.3125

Explanation:  $5 / 16 = 0.3125$



## SECTION 2: Speed, Distance & Time

Q6. ✓ Correct Answer: B) 2h 30min

Explanation:  $1200 / 480 = 2.5$  hours

Q7. ✓ Correct Answer: B) 750 km/h

Explanation: 1h 12m = 1.2h.  $900 / 1.2 = 750$  km/h

Q8. ✓ Correct Answer: C) 460 mph

Explanation:  $400 * 1.15 = 460$  mph

Q9. ✓ Correct Answer: B) 5 NM

Explanation: 30 knots \*  $(\frac{10}{60})$  hours = 5 NM

Q10. ✓ Correct Answer: B) 6 min

Explanation:  $15,000 / 2,500 = 6$  min

## SECTION 3: Ratios & Scales

Q11. ✓ Correct Answer: B) 36 m

Explanation:  $50 * 72 = 3,600$  cm = 36 m

Q12. ✓ Correct Answer: C) 12 L

Explanation:  $\frac{3}{5} * 20 = 12$  L

**Q13. ✓ Correct Answer: C) 6 hours**

**Explanation:**  $3 * 8 = 24$ .  $24 / 4 = 6$  hours

**Q14. ✓ Correct Answer: B) 200 tons**

**Explanation:** 1 unit = 50. 4 units = 200

**Q15. ✓ Correct Answer: B) 55 km**

**Explanation:**  $5.5 * 1,000,000 = 5,500,000$  cm = 55 km

## SECTION 4: Unit Conversions

**Q16. ✓ Correct Answer: B) 80 tons**

**Explanation:**  $80,000 / 1,000 = 80$  tons

**Q17. ✓ Correct Answer: A) 1.524 km**

**Explanation:**  $5,000 * 0.3048 = 1,524$  m = 1.524 km

**Q18. ✓ Correct Answer: C) 293.15 K**

**Explanation:**  $20 + 273.15 = 293.15$  K

**Q19. ✓ Correct Answer: B) 22.2 km**

**Explanation:**  $12 * 1.852 = 22.224$  km

**Q20. ✓ Correct Answer: B) 1 m<sup>3</sup>**

**Explanation:** 1,000 L = 1 m<sup>3</sup>



## SECTION 5: Powers, Roots & Surds

**Q21. ✓ Correct Answer: C) 625**

**Explanation:**  $5 * 5 * 5 * 5 = 625$

**Q22. ✓ Correct Answer: C) 32**

**Explanation:**  $32 * 32 = 1024$

**Q23. ✓ Correct Answer: C) 900**

**Explanation:**  $1000 - 100 = 900$

**Q24. ✓ Correct Answer: A) 0.12**

**Explanation:**  $0.3 * 0.4 = 0.12$

**Q25. ✓ Correct Answer: D) A and C**

**Explanation:**  $2^{(2+3+4)} = 2^9 = 512$

## SECTION 6: Areas, Volumes & Spaces

Q26. ✓ Correct Answer: A) 6

Explanation: Right triangle.  $0.5 * 3 * 4 = 6$

Q27. ✓ Correct Answer: B) 31.4 m<sup>3</sup>

Explanation:  $\pi * 1^2 * 10 = 31.4$

Q28. ✓ Correct Answer: A) 8 cm

Explanation:  $2(12+w) = 40 \rightarrow 12+w = 20 \rightarrow w = 8$

Q29. ✓ Correct Answer: C) 216 cm<sup>2</sup>

Explanation: Side = 6. Area =  $6 * 6^2 = 216$

Q30. ✓ Correct Answer: B) 10 m

Explanation:  $r^2 = 78.5 / 3.14 = 25 \rightarrow r = 5 \rightarrow d = 10$

## SECTION 7: Probability & Statistics

Q31. ✓ Correct Answer: C) 1/2

Explanation: Primes: 2, 3, 5.  $3/6 = 1/2$

Q32. ✓ Correct Answer: B) 5

Explanation: Sorted: 2, 3, 5, 8, 10 -> middle is 5

Q33. ✓ Correct Answer: A) 0

Explanation: No variation

Q34. ✓ Correct Answer: B) 9/25

Explanation:  $3/5 * 3/5 = 9/25$

Q35. ✓ Correct Answer: C) 4

Explanation: Most frequent

## SECTION 8: Algebraic Equations

Q36. ✓ Correct Answer: C) 12

Explanation:  $x/4 = 3 \rightarrow x = 12$

Q37. ✓ Correct Answer: A)  $x^2 - 2x - 15$

Explanation:  $x^2 - 5x + 3x - 15$

Q38. ✓ Correct Answer: B) -2

Explanation:  $2x = -4 \rightarrow x = -2$

**Q39. ✓ Correct Answer: C) 9**  
**Explanation:**  $x - 4 = 5 \rightarrow x = 9$

**Q40. ✓ Correct Answer: B) -7**  
**Explanation:** Negative root

## SECTION 9: Trigonometry

**Q41. ✓ Correct Answer: A) 13**  
**Explanation:**  $\sqrt{25 + 144} = 13$

**Q42. ✓ Correct Answer: A) 0**  
**Explanation:** Standard value

**Q43. ✓ Correct Answer: B) 45°**  
**Explanation:**  $\tan \theta = 10/10 = 1 \rightarrow \theta = 45$

**Q44. ✓ Correct Answer: C) 0.6**  
**Explanation:**  $\sqrt{1 - 0.64} = 0.6$

**Q45. ✓ Correct Answer: B) 1**  
**Explanation:**  $0.5 + 0.5 = 1$



## SECTION 10: Complex Operations

**Q46. ✓ Correct Answer: B) 90**  
**Explanation:**  $0.15 * 600 = 90$

**Q47. ✓ Correct Answer: B) 13:20 next day**  
**Explanation:**  $22:30 + 14h 50m = 37:20 \rightarrow 13:20 \text{ next day}$

**Q48. ✓ Correct Answer: B) 800 L/h**  
**Explanation:**  $4000 / 5 = 800$

## SECTION 11: Word Problems

**Q49. ✓ Correct Answer: B) 162**  
**Explanation:**  $180 - 18 = 162$

**Q50. ✓ Correct Answer: B) 22,500**  
**Explanation:**  $300 * 75 = 22,500$