2.18 Statistics, Probability and Data Depth: 2-hour Pack

ISEB CE 13+ Mathematics · Calculator allowed · about 120 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 The mean mass in kg of 14 cats is 76. The mean mass in kg of 6 dogs is 86. What is the mean mass in kg of all 20 together?

- [ ] A) 80
- [ ] B) 113.4
- [ ] C) 79
- [ ] D) 10
- [ ] E) 81

---

2 The probability that Siobhan's train is on time is 0.8 on Monday and 0.7 on Tuesday, independently. What is the probability that it is on time on both days?

- [ ] A) 0.44
- [ ] B) 0.56
- [ ] C) 0.38
- [ ] D) 0.06
- [ ] E) 0.62

---

3 Two fair six-sided dice are rolled and the scores are added. What is the probability that the total is 3? Give your answer as a fraction in its simplest form.

- [ ] A) 1/6
- [ ] B) 1/36
- [ ] C) 1/18
- [ ] D) 1/9
- [ ] E) 1/11

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4 The mean of 7 numbers is 30. 6 of the numbers are 32, 25, 24, 33, 38, 29. What is the other number?

- [ ] A) 30
- [ ] B) 391
- [ ] C) 14.5
- [ ] D) 29
- [ ] E) -1

---

5 The mean mark of 12 boys is 63. The mean mark of 7 girls is 82. What is the mean mark of all 19 together?

- [ ] A) 70
- [ ] B) 71
- [ ] C) 75
- [ ] D) 665
- [ ] E) 72.5

---

6 The grouped table shows the masses, x kg, of some measurements, with the frequency for each class.

$0 < x \leq 20$: 3
$20 < x \leq 40$: 12
$40 < x \leq 60$: 7
$60 < x \leq 80$: 4
$80 < x \leq 100$: 14

Calculate an estimate of the mean.

- [ ] A) 2280
- [ ] B) 57
- [ ] C) 67
- [ ] D) 90
- [ ] E) 8

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7 The probability that Mohammed's train is on time is 0.8 on Monday and 0.4 on Tuesday, independently. What is the probability that it is on time on both days?

- [ ] A) 0.48
- [ ] B) 0.68
- [ ] C) 0.44
- [ ] D) 0.12
- [ ] E) 0.32

---

8 4 fair coins are tossed. What is the probability of getting at least one head? Give your answer as a fraction in its simplest form.

- [ ] A) 15/16
- [ ] B) 1/16
- [ ] C) 7/8
- [ ] D) 1/4
- [ ] E) 15/32

---

9 The mean of 4 numbers is 23. 3 of the numbers are 31, 26, 26. What is the other number?

- [ ] A) 4.5
- [ ] B) 8
- [ ] C) 23
- [ ] D) 9
- [ ] E) 175

---

10 The mean mark of 7 boys is 63. The mean mark of 16 girls is 40. What is the mean mark of all 23 together?

- [ ] A) 540.5
- [ ] B) 56
- [ ] C) 47
- [ ] D) 11.5
- [ ] E) 48

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11 The grouped table shows the masses, x kg, of some measurements, with the frequency for each class.

$40 < x \leq 50$: 6

$50 < x \leq 60$: 10

$60 < x \leq 70$: 12

$70 < x \leq 80$: 12

Calculate an estimate of the mean.

- [ ] A) 67.5
- [ ] B) 62.5
- [ ] C) 60
- [ ] D) 57.5
- [ ] E) 10

---

12 The probability that Dev's train is on time is 0.2 on Monday and 0.2 on Tuesday, independently. What is the probability that it is on time on both days?

- [ ] A) 0.68
- [ ] B) 0.32
- [ ] C) 0.4
- [ ] D) 0.6
- [ ] E) 0.04

---

13 Two fair six-sided dice are rolled and the scores are added. What is the probability that the total is 7? Give your answer as a fraction in its simplest form.

- [ ] A) 5/36
- [ ] B) 1/2
- [ ] C) 1/6
- [ ] D) 1/7
- [ ] E) 7/36

---

14 The mean of 7 numbers is 19. 6 of the numbers are 14, 19, 13, 13, 12, 22. What is the other number?

- [ ] A) 40
- [ ] B) 226
- [ ] C) 21
- [ ] D) 41
- [ ] E) 15.5

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15 The mean mass in kg of 15 cats is 61. The mean mass in kg of 12 dogs is 52. What is the mean mass in kg of all 27 together?

- [ ] A) 56
- [ ] B) 58
- [ ] C) 8.55
- [ ] D) 57
- [ ] E) 56.5

---

16 The grouped table shows the masses, x kg, of some measurements, with the frequency for each class.

$10 < x \leq 15$: 9

$15 < x \leq 20$: 6

$20 < x \leq 25$: 12

$25 < x \leq 30$: 13

Calculate an estimate of the mean.

- [ ] A) 20
- [ ] B) 21.125
- [ ] C) 10
- [ ] D) 27.5
- [ ] E) 23.625

---

17 A bag has 5 red and 3 blue counters. Kwame takes two counters at random, one after the other, without putting the first back. What is the probability that they are both red? Give your answer as a fraction in its simplest form.

- [ ] A) 15/56
- [ ] B) 25/64
- [ ] C) 5/8
- [ ] D) 15/32
- [ ] E) 5/14

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18 A pencil case contains 4 blue pens and 6 black pens, and nothing else (10 pens in total). Two pens are taken at random, one after the other, without replacement.

(a) Find the probability that both pens taken are blue. **(2)**

.....

(b) Find the probability that the two pens taken are the same colour. **(3)**

.....

---

19 Two fair six-sided dice are rolled and the scores are added. What is the probability that the total is 8? Give your answer as a fraction in its simplest form.

- ☐ A) 5/36
- ☐ B) 1/6
- ☐ C) 5/12
- ☐ D) 1/9
- ☐ E) 1/8

---

20 The mean of 4 numbers is 18. Another number, 28, is added to the list. What is the mean of all 5 numbers?

- ☐ A) 46
- ☐ B) 20
- ☐ C) 8.8
- ☐ D) 23.6
- ☐ E) 25

---

21 The mean mass in kg of 14 cats is 46. The mean mass in kg of 19 dogs is 79. What is the mean mass in kg of all 33 together?

- ☐ A) 60
- ☐ B) 16.5
- ☐ C) 65
- ☐ D) 1072.5
- ☐ E) 29.072

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22 The grouped table shows the masses, x kg, of some measurements, with the frequency for each class.

$10 < x \leq 20$: 9

$20 < x \leq 30$: 12

$30 < x \leq 40$: 9

$40 < x \leq 50$: 8

$50 < x \leq 60$: 12

Calculate an estimate of the mean.

- [ ] A) 35
- [ ] B) 40.4
- [ ] C) 30.4
- [ ] D) 10
- [ ] E) 35.4

---

23 The probability that Zainab's train is on time is 0.1 on Monday and 0.7 on Tuesday, independently. What is the probability that it is on time on both days?

- [ ] A) 0.03
- [ ] B) 0.2
- [ ] C) 0.66
- [ ] D) 0.07
- [ ] E) 0.8

---

24 Two fair six-sided dice are rolled and the scores are added. What is the probability that the total is 6? Give your answer as a fraction in its simplest form.

- [ ] A) 5/36
- [ ] B) 5/12
- [ ] C) 5/18
- [ ] D) 1/6
- [ ] E) 1/9

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25 The mean of 6 numbers is 29. 5 of the numbers are 21, 34, 35, 26, 25. What is the other number?

- [ ] A) 32
- [ ] B) 28.2
- [ ] C) 4
- [ ] D) 34
- [ ] E) 33

---

26 The mean score of 13 Year 8 pupils is 65. The mean score of 4 Year 9 pupils is 31. What is the mean score of all 17 together?

- [ ] A) 39
- [ ] B) 57
- [ ] C) 484.5
- [ ] D) 48
- [ ] E) 58

---

27 The grouped table shows the times, x seconds, of some measurements, with the frequency for each class.

$20 < x \leq 40$: 9
$40 < x \leq 60$: 3
$60 < x \leq 80$: 6
$80 < x \leq 100$: 13
$100 < x \leq 120$: 9

Calculate an estimate of the mean.

- [ ] A) 90
- [ ] B) 65
- [ ] C) 70
- [ ] D) 75
- [ ] E) 85

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28 A bag has 4 red and 3 blue counters. Chloe takes two counters at random, one after the other, without putting the first back. What is the probability that they are both red? Give your answer as a fraction in its simplest form.

- [ ] A) 12/49
- [ ] B) 16/49
- [ ] C) 2/7
- [ ] D) 1/7
- [ ] E) 24/49

---

29 The mean of 5 numbers is 12. 4 of the numbers are 12, 10, 4, 16. What is the other number?

- [ ] A) 10.5
- [ ] B) 12
- [ ] C) 19
- [ ] D) 18
- [ ] E) 6

---

30 The mean mass in kg of 6 cats is 61. The mean mass in kg of 5 dogs is 83. What is the mean mass in kg of all 11 together?

- [ ] A) 71
- [ ] B) 73
- [ ] C) 72
- [ ] D) 390.5
- [ ] E) 5.5

---

31 The grouped table shows the heights, x cm, of some measurements, with the frequency for each class.

$40 < x \leq 50$: 8

$50 < x \leq 60$: 2

$60 < x \leq 70$: 8

$70 < x \leq 80$: 7

Calculate an estimate of the mean.

- [ ] A) 45
- [ ] B) 65.6
- [ ] C) 60.6
- [ ] D) 6.25
- [ ] E) 60

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32 Two fair six-sided dice are rolled and the scores are added. What is the probability that the total is 11? Give your answer as a fraction in its simplest form.

- [ ] A) 1/12
- [ ] B) 1/6
- [ ] C) 1/36
- [ ] D) 1/11
- [ ] E) 1/18

---

33 The mean of 5 numbers is 18. 4 of the numbers are 20, 23, 20, 15. What is the other number?

- [ ] A) -6
- [ ] B) 11
- [ ] C) 6
- [ ] D) 12
- [ ] E) 168

---

34 The mean mass in kg of 15 cats is 72. The mean mass in kg of 8 dogs is 49. What is the mean mass in kg of all 23 together?

- [ ] A) 736
- [ ] B) 65
- [ ] C) 64
- [ ] D) 60.5
- [ ] E) 57

---

35 The grouped table shows the times, x seconds, of some measurements, with the frequency for each class.

$40 < x \leq 45$: 9

$45 < x \leq 50$: 4

$50 < x \leq 55$: 5

$55 < x \leq 60$: 2

Calculate an estimate of the mean.

- [ ] A) 950
- [ ] B) 42.5
- [ ] C) 50
- [ ] D) 5
- [ ] E) 47.5

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36 The probability that Sophie's train is on time is 0.4 on Monday and 0.3 on Tuesday, independently. What is the probability that it is on time on both days?

- [ ] A) 0.12
- [ ] B) 0.46
- [ ] C) 0.28
- [ ] D) 0.88
- [ ] E) 0.7

---

37 The mean of 7 numbers is 28. 6 of the numbers are 28, 24, 29, 30, 35, 26. What is the other number?

- [ ] A) 25
- [ ] B) 24
- [ ] C) 28
- [ ] D) 12
- [ ] E) -4

---

38 The mean score of 15 Year 8 pupils is 51. The mean score of 4 Year 9 pupils is 32. What is the mean score of all 19 together?

- [ ] A) 446.5
- [ ] B) 48
- [ ] C) 41.5
- [ ] D) 9.5
- [ ] E) 47

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39 The grouped table shows the heights, x cm, of some measurements, with the frequency for each class.

$40 < x \leq 60$: 9

$60 < x \leq 80$: 5

$80 < x \leq 100$: 5

$100 < x \leq 120$: 11

$120 < x \leq 140$: 10

Calculate an estimate of the mean.

- [ ] A) 90
- [ ] B) 3760
- [ ] C) 104
- [ ] D) 94
- [ ] E) 110

---

40 The probability that Kwame's train is on time is 0.1 on Monday and 0.4 on Tuesday, independently. What is the probability that it is late on both days?

- [ ] A) 0.5
- [ ] B) 0.96
- [ ] C) 0.54
- [ ] D) 0.42
- [ ] E) 0.06

---

41 Two fair six-sided dice are rolled and the scores are added. What is the probability that the total is 10? Give your answer as a fraction in its simplest form.

- [ ] A) 1/12
- [ ] B) 1/4
- [ ] C) 1/10
- [ ] D) 11/12
- [ ] E) 1/11

---

42 The mean of 6 numbers is 14. 5 of the numbers are 6, 18, 22, 15, 6. What is the other number?

- [ ] A) 14
- [ ] B) 17
- [ ] C) 18
- [ ] D) 13.4
- [ ] E) 3

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43 The mean mass in kg of 20 cats is 50. The mean mass in kg of 8 dogs is 57. What is the mean mass in kg of all 28 together?

- [ ] A) 52
- [ ] B) 14
- [ ] C) 55
- [ ] D) 53
- [ ] E) 9.1

---

44 The grouped table shows the heights, x cm, of some measurements, with the frequency for each class.

$20 < x \leq 30$: 9
$30 < x \leq 40$: 11
$40 < x \leq 50$: 5
$50 < x \leq 60$: 13
$60 < x \leq 70$: 2

Calculate an estimate of the mean.

- [ ] A) 55
- [ ] B) 37
- [ ] C) 45
- [ ] D) 42
- [ ] E) 8

---

45 The probability that Ben's train is on time is 0.7 on Monday and 0.3 on Tuesday, independently. What is the probability that it is on time on both days?

- [ ] A) 0.58
- [ ] B) 0.21
- [ ] C) 0.79
- [ ] D) 0.42
- [ ] E) 0.49

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46 Two fair six-sided dice are rolled and the scores are multiplied. What is the probability that the product is 4? Give your answer as a fraction in its simplest form.

- [ ] A) 1/4
- [ ] B) 1/6
- [ ] C) 1/12
- [ ] D) 1/36
- [ ] E) 1/18

---

47 The mean mark of 20 boys is 64. The mean mark of 10 girls is 34. What is the mean mark of all 30 together?

- [ ] A) 44
- [ ] B) 15
- [ ] C) 54
- [ ] D) 810
- [ ] E) 49

---

48 The mean mark of 7 boys is 46. The mean mark of 18 girls is 71. What is the mean mark of all 25 together?

- [ ] A) 800
- [ ] B) 58.5
- [ ] C) 65
- [ ] D) 12.5
- [ ] E) 64

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49 The grouped table shows the times, x seconds, of some measurements, with the frequency for each class.

$10 < x \leq 20$: 13

$20 < x \leq 30$: 12

$30 < x \leq 40$: 7

$40 < x \leq 50$: 9

$50 < x \leq 60$: 9

Calculate an estimate of the mean.

- [ ] A) 15
- [ ] B) 37.8
- [ ] C) 1640
- [ ] D) 32.8
- [ ] E) 10

---

50 The probability that Freddie's train is on time is 0.7 on Monday and 0.7 on Tuesday, independently. What is the probability that it is late on both days?

- [ ] A) 0.09
- [ ] B) 0.21
- [ ] C) 0.49
- [ ] D) 0.58
- [ ] E) 0.51

---

51 3 fair coins are tossed. What is the probability of getting exactly 2 heads? Give your answer as a fraction in its simplest form.

- [ ] A) 3/8
- [ ] B) 5/8
- [ ] C) 1/4
- [ ] D) 3/4
- [ ] E) 1/2

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52 The mean of 8 numbers is 24. 7 of the numbers are 31, 19, 21, 17, 24, 32, 24. What is the other number?

- [ ] A) 360
- [ ] B) 0
- [ ] C) 12
- [ ] D) 23
- [ ] E) 24

---

53 The mean mass in kg of 19 cats is 43. The mean mass in kg of 16 dogs is 78. What is the mean mass in kg of all 35 together?

- [ ] A) 60.5
- [ ] B) 60
- [ ] C) 17.5
- [ ] D) 59
- [ ] E) 62

---

54 The grouped table shows the heights, x cm, of some measurements, with the frequency for each class.

$10 < x \leq 15$: 2
$15 < x \leq 20$: 3
$20 < x \leq 25$: 8
$25 < x \leq 30$: 12

Calculate an estimate of the mean.

- [ ] A) 6.25
- [ ] B) 23.5
- [ ] C) 20
- [ ] D) 26
- [ ] E) 587.5

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55 A bag has 8 red and 2 blue counters. Ffion takes two counters at random, one after the other, without putting the first back. What is the probability that they are both red? Give your answer as a fraction in its simplest form.

- [ ] A) 8/25
- [ ] B) 1/45
- [ ] C) 8/45
- [ ] D) 28/45
- [ ] E) 4/5

---

56 3 fair coins are tossed. What is the probability of getting exactly 2 heads? Give your answer as a fraction in its simplest form.

- [ ] A) 3/4
- [ ] B) 3/8
- [ ] C) 2/3
- [ ] D) 1/4
- [ ] E) 5/8

---

57 The mean of 8 numbers is 19. 7 of the numbers are 15, 23, 23, 27, 25, 20, 14. What is the other number?

- [ ] A) 19
- [ ] B) 4
- [ ] C) 299
- [ ] D) 2.5
- [ ] E) 5

---

58 The mean mark of 9 boys is 55. The mean mark of 12 girls is 41. What is the mean mark of all 21 together?

- [ ] A) 47
- [ ] B) 49
- [ ] C) 493.5
- [ ] D) 10.5
- [ ] E) 48

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59 The grouped table shows the masses, x kg, of some measurements, with the frequency for each class.

$0 < x \leq 5$: 10

$5 < x \leq 10$: 8

$10 < x \leq 15$: 9

$15 < x \leq 20$: 9

$20 < x \leq 25$: 14

Calculate an estimate of the mean.

- [ ] A) 22.5
- [ ] B) 10.9
- [ ] C) 13.4
- [ ] D) 12.5
- [ ] E) 670

---

60 The probability that Amira's train is on time is 0.8 on Monday and 0.2 on Tuesday, independently. What is the probability that it is late on both days?

- [ ] A) 0.32
- [ ] B) 0.64
- [ ] C) 0.16
- [ ] D) 0.68
- [ ] E) 0.84

---

61 A fair spinner has 5 equal sections numbered 1 to 5, and a fair six-sided die is rolled. The two scores are added. What is the probability that the total is even? Give your answer as a fraction in its simplest form.

- [ ] A) 1/4
- [ ] B) 5/12
- [ ] C) 1/6
- [ ] D) 1/2
- [ ] E) 1/12

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62 The mean mark of 13 boys is 79. The mean mark of 8 girls is 58. What is the mean mark of all 21 together?

- [ ] A) 72
- [ ] B) 71
- [ ] C) 745.5
- [ ] D) 66
- [ ] E) 68.5

---

63 The grouped table shows the times, x seconds, of some measurements, with the frequency for each class.

$40 < x \leq 50$: 2

$50 < x \leq 60$: 7

$60 < x \leq 70$: 12

$70 < x \leq 80$: 4

Calculate an estimate of the mean.

- [ ] A) 62.2
- [ ] B) 60
- [ ] C) 1555
- [ ] D) 6.25
- [ ] E) 67.2

---

64 A bag has 7 red and 4 blue counters. Nia takes two counters at random, one after the other, without putting the first back. What is the probability that they are both red? Give your answer as a fraction in its simplest form.

- [ ] A) 49/121
- [ ] B) 14/55
- [ ] C) 56/121
- [ ] D) 21/55
- [ ] E) 7/11

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65 Two fair six-sided dice are rolled and the scores are added. What is the probability that the total is 11? Give your answer as a fraction in its simplest form.

- [ ] A) 1/18
- [ ] B) 1/12
- [ ] C) 17/18
- [ ] D) 1/9
- [ ] E) 1/11

---

66 The mean of 7 numbers is 19. 6 of the numbers are 23, 24, 11, 14, 20, 11. What is the other number?

- [ ] A) 19
- [ ] B) 11
- [ ] C) 30
- [ ] D) 236
- [ ] E) 15

---

67 The mean mark of 13 boys is 75. The mean mark of 11 girls is 51. What is the mean mark of all 24 together?

- [ ] A) 12
- [ ] B) 768
- [ ] C) 68.25
- [ ] D) 63
- [ ] E) 64

---

68 The grouped table shows the times, x seconds, of some measurements, with the frequency for each class.

$10 < x \leq 30$: 9

$30 < x \leq 50$: 5

$50 < x \leq 70$: 7

$70 < x \leq 90$: 4

Calculate an estimate of the mean.

- [ ] A) 34.8
- [ ] B) 44.8
- [ ] C) 50
- [ ] D) 1120
- [ ] E) 20

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69 The probability that Amira's train is on time is 0.7 on Monday and 0.6 on Tuesday, independently. What is the probability that it is late on both days?

- [ ] A) 0.42
- [ ] B) 0.28
- [ ] C) 0.54
- [ ] D) 0.12
- [ ] E) 0.58

---

70 Two fair six-sided dice are rolled and the scores are added. What is the probability that the total is 8? Give your answer as a fraction in its simplest form.

- [ ] A) 5/12
- [ ] B) 1/11
- [ ] C) 5/36
- [ ] D) 1/6
- [ ] E) 1/9

---

71 The mean of 8 numbers is 21. 7 of the numbers are 14, 20, 22, 27, 28, 15, 25. What is the other number?

- [ ] A) 17
- [ ] B) 21
- [ ] C) 16
- [ ] D) 8.5
- [ ] E) 18

---

72 The mean mass in kg of 20 cats is 55. The mean mass in kg of 6 dogs is 81. What is the mean mass in kg of all 26 together?

- [ ] A) 68
- [ ] B) 61
- [ ] C) 13
- [ ] D) 75
- [ ] E) 793

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73 The grouped table shows the times, x seconds, of some measurements, with the frequency for each class.

$0 < x \leq 5$: 12

$5 < x \leq 10$: 10

$10 < x \leq 15$: 10

$15 < x \leq 20$: 8

Calculate an estimate of the mean.

- [ ] A) 11.75
- [ ] B) 2.5
- [ ] C) 6.75
- [ ] D) 10
- [ ] E) 9.25

---

74 A bag has 2 red and 8 blue counters. Lucy takes two counters at random, one after the other, without putting the first back. What is the probability that they are both red? Give your answer as a fraction in its simplest form.

- [ ] A) 2/45
- [ ] B) 28/45
- [ ] C) 1/25
- [ ] D) 1/45
- [ ] E) 1/50

---

75 3 fair coins are tossed. What is the probability of getting exactly 1 head? Give your answer as a fraction in its simplest form.

- [ ] A) 3/4
- [ ] B) 1/2
- [ ] C) 3/8
- [ ] D) 1/3
- [ ] E) 5/8

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76 The mean score of 7 Year 8 pupils is 44. The mean score of 20 Year 9 pupils is 71. What is the mean score of all 27 together?

- [ ] A) 65
- [ ] B) 864
- [ ] C) 13.5
- [ ] D) 51
- [ ] E) 64

---

77 The grouped table shows the times, x seconds, of some measurements, with the frequency for each class.

$0 < x \leq 20$: 8

$20 < x \leq 40$: 4

$40 < x \leq 60$: 7

$60 < x \leq 80$: 4

$80 < x \leq 100$: 2

Calculate an estimate of the mean.

- [ ] A) 50.4
- [ ] B) 40.4
- [ ] C) 1010
- [ ] D) 10
- [ ] E) 5

---

78 A bag has 2 red and 3 blue counters. Rhys takes two counters at random, one after the other, without putting the first back. What is the probability that they are both red? Give your answer as a fraction in its simplest form.

- [ ] A) 1/10
- [ ] B) 1/5
- [ ] C) 2/5
- [ ] D) 3/10
- [ ] E) 12/25

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79 Two fair six-sided dice are rolled. What is the probability that the difference between the scores is 0? Give your answer as a fraction in its simplest form.

- [ ] A) 1/3
- [ ] B) 1/6
- [ ] C) 1/36
- [ ] D) 13/36
- [ ] E) 5/6

---

80 The mean of 6 numbers is 27. Another number, 20, is added to the list. What is the mean of all 7 numbers?

- [ ] A) 91/3
- [ ] B) 23.5
- [ ] C) 209/7
- [ ] D) 28
- [ ] E) 26

---

81 The mean mass in kg of 8 cats is 70. The mean mass in kg of 14 dogs is 59. What is the mean mass in kg of all 22 together?

- [ ] A) 64.5
- [ ] B) 12.375
- [ ] C) 66
- [ ] D) 63
- [ ] E) 11

---

82 The grouped table shows the masses, x kg, of some measurements, with the frequency for each class.

$40 < x \leq 50$: 3
$50 < x \leq 60$: 8
$60 < x \leq 70$: 6
$70 < x \leq 80$: 3

Calculate an estimate of the mean.

- [ ] A) 1190
- [ ] B) 64.5
- [ ] C) 59.5
- [ ] D) 55
- [ ] E) 54.5

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83 A bag has 7 red and 5 blue counters. Mohammed takes two counters at random, one after the other, without putting the first back. What is the probability that they are one red and one blue? Give your answer as a fraction in its simplest form.

- [ ] A) 7/11
- [ ] B) 35/72
- [ ] C) 49/144
- [ ] D) 35/66
- [ ] E) 35/132

---

84 Two fair six-sided dice are rolled and the scores are added. What is the probability that the total is 2? Give your answer as a fraction in its simplest form.

- [ ] A) 35/36
- [ ] B) 1/36
- [ ] C) 1/18
- [ ] D) 1/11
- [ ] E) 1/12

---

85 The mean of 5 numbers is 15. 4 of the numbers are 8, 16, 8, 19. What is the other number?

- [ ] A) 15
- [ ] B) 23
- [ ] C) 12.75
- [ ] D) 126
- [ ] E) 24

---

86 The mean mark of 18 boys is 60. The mean mark of 15 girls is 82. What is the mean mark of all 33 together?

- [ ] A) 1155
- [ ] B) 72
- [ ] C) 70
- [ ] D) 71
- [ ] E) 16.5

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87 The grouped table shows the times, x seconds, of some measurements, with the frequency for each class.

$0 < x \leq 10$: 3

$10 < x \leq 20$: 10

$20 < x \leq 30$: 14

$30 < x \leq 40$: 10

$40 < x \leq 50$: 13

Calculate an estimate of the mean.

- [ ] A) 29
- [ ] B) 25
- [ ] C) 24
- [ ] D) 34
- [ ] E) 1450

---

88 The probability that Archie's train is on time is 0.8 on Monday and 0.7 on Tuesday, independently. What is the probability that it is on time on exactly one of the two days?

- [ ] A) 0.44
- [ ] B) 0.06
- [ ] C) 0.56
- [ ] D) 0.24
- [ ] E) 0.38

---

89 4 fair coins are tossed. What is the probability of getting exactly 0 heads? Give your answer as a fraction in its simplest form.

- [ ] A) 1/16
- [ ] B) 1/8
- [ ] C) 1/4
- [ ] D) 15/16
- [ ] E) 1/2

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90 The mean mass in kg of 12 cats is 69. The mean mass in kg of 19 dogs is 38. What is the mean mass in kg of all 31 together?

- [ ] A) 15.5
- [ ] B) 50
- [ ] C) 775
- [ ] D) 51
- [ ] E) 57

---

91 The grouped table shows the masses, x kg, of some measurements, with the frequency for each class.

$0 < x \leq 20$: 9

$20 < x \leq 40$: 14

$40 < x \leq 60$: 9

$60 < x \leq 80$: 5

$80 < x \leq 100$: 3

Calculate an estimate of the mean.

- [ ] A) 50
- [ ] B) 49.5
- [ ] C) 8
- [ ] D) 39.5
- [ ] E) 1580

---

92 The probability that Eleni's train is on time is 0.5 on Monday and 0.1 on Tuesday, independently. What is the probability that it is on time on both days?

- [ ] A) 0.05
- [ ] B) 0.5
- [ ] C) 0.95
- [ ] D) 0.6
- [ ] E) 0.45

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93 4 fair coins are tossed. What is the probability of getting exactly 3 heads? Give your answer as a fraction in its simplest form.

- [ ] A) 1/8
- [ ] B) 1/4
- [ ] C) 5/16
- [ ] D) 1/2
- [ ] E) 3/4

---

94 The mean of 5 numbers is 17. One of the numbers, 9, is removed. What is the mean of the remaining 4 numbers?

- [ ] A) 23.5
- [ ] B) 13
- [ ] C) 14.75
- [ ] D) 8
- [ ] E) 19

---

95 The mean mass in kg of 19 cats is 71. The mean mass in kg of 20 dogs is 32. What is the mean mass in kg of all 39 together?

- [ ] A) 19.5
- [ ] B) 52
- [ ] C) 994.5
- [ ] D) 51
- [ ] E) 51.5

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96 The grouped table shows the masses, x kg, of some measurements, with the frequency for each class.

$0 < x \leq 5$: 2

$5 < x \leq 10$: 10

$10 < x \leq 15$: 13

$15 < x \leq 20$: 8

$20 < x \leq 25$: 7

Calculate an estimate of the mean.

- [ ] A) 16
- [ ] B) 11
- [ ] C) 13.5
- [ ] D) 8
- [ ] E) 540

---

97 The probability that Dev's train is on time is 0.3 on Monday and 0.1 on Tuesday, independently. What is the probability that it is late on both days?

- [ ] A) 0.27
- [ ] B) 0.63
- [ ] C) 0.6
- [ ] D) 0.34
- [ ] E) 0.4

---

98 Two fair six-sided dice are rolled and the scores are added. What is the probability that the total is 2? Give your answer as a fraction in its simplest form.

- [ ] A) 1/18
- [ ] B) 35/36
- [ ] C) 1/2
- [ ] D) 1/11
- [ ] E) 1/36

---

99 The mean of 4 numbers is 16. 3 of the numbers are 16, 14, 11. What is the other number?

- [ ] A) 105
- [ ] B) 23
- [ ] C) 22
- [ ] D) 11.5
- [ ] E) 7

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100 The mean score of 6 Year 8 pupils is 75. The mean score of 15 Year 9 pupils is 33. What is the mean score of all 21 together?

- [ ] A) 45
- [ ] B) 54
- [ ] C) 46
- [ ] D) 63
- [ ] E) 10.5

---

101 The grouped table shows the heights, x cm, of some measurements, with the frequency for each class.

$40 < x \leq 60$: 4
$60 < x \leq 80$: 5
$80 < x \leq 100$: 4
$100 < x \leq 120$: 8
$120 < x \leq 140$: 4

Calculate an estimate of the mean.

- [ ] A) 82.4
- [ ] B) 77
- [ ] C) 92.4
- [ ] D) 90
- [ ] E) 102.4

---

102 A bag has 8 red and 4 blue counters. Uma takes two counters at random, one after the other, without putting the first back. What is the probability that they are both red? Give your answer as a fraction in its simplest form.

- [ ] A) 8/33
- [ ] B) 28/33
- [ ] C) 7/18
- [ ] D) 14/33
- [ ] E) 4/9

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103 The mean of 4 numbers is 12. 3 of the numbers are 16, 9, 8. What is the other number?

- [ ] A) 16
- [ ] B) 12
- [ ] C) 3
- [ ] D) 15
- [ ] E) 7.5

---

104 The mean mass in kg of 14 cats is 65. The mean mass in kg of 4 dogs is 38. What is the mean mass in kg of all 18 together?

- [ ] A) 51.5
- [ ] B) 60
- [ ] C) 44
- [ ] D) 531
- [ ] E) 59

---

105 The grouped table shows the times, x seconds, of some measurements, with the frequency for each class.

$10 < x \leq 30$: 9

$30 < x \leq 50$: 10

$50 < x \leq 70$: 7

$70 < x \leq 90$: 14

Calculate an estimate of the mean.

- [ ] A) 63
- [ ] B) 53
- [ ] C) 43
- [ ] D) 80
- [ ] E) 10

---

106 A bag has 8 red and 2 blue counters. Sophie takes two counters at random, one after the other, without putting the first back. What is the probability that they are one red and one blue? Give your answer as a fraction in its simplest form.

- [ ] A) 16/45
- [ ] B) 14/25
- [ ] C) 8/45
- [ ] D) 8/25
- [ ] E) 4/5

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107 The mean of 8 numbers is 28. 7 of the numbers are 33, 29, 25, 35, 31, 23, 22. What is the other number?

- [ ] A) 26
- [ ] B) 25
- [ ] C) 27
- [ ] D) -2
- [ ] E) 422

---

108 The mean score of 12 Year 8 pupils is 77. The mean score of 20 Year 9 pupils is 53. What is the mean score of all 32 together?

- [ ] A) 68
- [ ] B) 62
- [ ] C) 63
- [ ] D) 992
- [ ] E) 16

---

109 The grouped table shows the masses, x kg, of some measurements, with the frequency for each class.

$0 < x \leq 5$: 9

$5 < x \leq 10$: 6

$10 < x \leq 15$: 11

$15 < x \leq 20$: 14

Calculate an estimate of the mean.

- [ ] A) 450
- [ ] B) 13.75
- [ ] C) 11.25
- [ ] D) 10
- [ ] E) 8.75

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110 A bag has 5 red and 6 blue counters. Eleni takes two counters at random, one after the other, without putting the first back. What is the probability that they are one red and one blue? Give your answer as a fraction in its simplest form.

- [ ] A) 25/121
- [ ] B) 3/11
- [ ] C) 60/121
- [ ] D) 6/11
- [ ] E) 4/11

---

111 Two fair six-sided dice are rolled and the scores are added. What is the probability that the total is 12? Give your answer as a fraction in its simplest form.

- [ ] A) 1/18
- [ ] B) 35/36
- [ ] C) 1/36
- [ ] D) 1/11
- [ ] E) 1/12

---

112 The mean of 5 numbers is 13. 4 of the numbers are 19, 20, 12, 13. What is the other number?

- [ ] A) 0.5
- [ ] B) 129
- [ ] C) -12
- [ ] D) 0
- [ ] E) 1

---

113 The mean mass in kg of 19 cats is 76. The mean mass in kg of 9 dogs is 48. What is the mean mass in kg of all 28 together?

- [ ] A) 62
- [ ] B) 57
- [ ] C) 938
- [ ] D) 67
- [ ] E) 68

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114 The grouped table shows the times, x seconds, of some measurements, with the frequency for each class.

$20 < x \leq 25$: 6

$25 < x \leq 30$: 14

$30 < x \leq 35$: 5

$35 < x \leq 40$: 12

$40 < x \leq 45$: 3

Calculate an estimate of the mean.

- [ ] A) 31.5
- [ ] B) 28
- [ ] C) 32.5
- [ ] D) 34
- [ ] E) 29

---

115 The probability that Hamza's train is on time is 0.1 on Monday and 0.6 on Tuesday, independently. What is the probability that it is on time on both days?

- [ ] A) 0.58
- [ ] B) 0.04
- [ ] C) 0.06
- [ ] D) 0.36
- [ ] E) 0.94

---

116 Two fair six-sided dice are rolled and the scores are multiplied. What is the probability that the product is even? Give your answer as a fraction in its simplest form.

- [ ] A) 1/4
- [ ] B) 3/4
- [ ] C) 3/8
- [ ] D) 2/3
- [ ] E) 1/2

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117 The mean score of 15 Year 8 pupils is 47. The mean score of 13 Year 9 pupils is 75. What is the mean score of all 28 together?

- ☐ A) 14
- ☐ B) 62
- ☐ C) 60
- ☐ D) 61
- ☐ E) 840

---

118 A bag contains counters that are either red or blue. On any single pick, the probability of picking a red counter at random is 0.4. A counter is picked at random, its colour is noted, and it is replaced before a second counter is picked at random. You may find it helpful to draw a tree diagram.

(a) Find the probability that both counters picked are red. **(2)**

.....

(b) Find the probability that exactly one of the two counters picked is red. **(3)**

.....

(c) Find the probability that at least one of the two counters picked is red. **(2)**

.....

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Mark scheme · 2.18 Statistics, Probability and Data Depth: 2-hour Pack

Question 1

C cao (79); find each total, add them, divide by the total number **B1**

Answer: C) 79

Question 2

B cao (0.56); multiply along the branches; add the matching routes **B1**

Answer: B) 0.56

Question 3

C cao (1/18); list the equally likely outcomes and count the favourable ones **B1**

Answer: C) 1/18

Question 4

D cao (29); mean x number of values = total **B1**

Answer: D) 29

Question 5

A cao (70); find each total, add them, divide by the total number **B1**

Answer: A) 70

Question 6

B cao (57); use the midpoint of each class **B1**

Answer: B) 57

Question 7

E cao (0.32); multiply along the branches; add the matching routes **B1**

Answer: E) 0.32

Question 8

A cao (15/16); list the equally likely outcomes and count the favourable ones **B1**

Answer: A) 15/16

Question 9

D cao (9); mean x number of values = total **B1**

Answer: D) 9

Question 10

C cao (47); find each total, add them, divide by the total number **B1**

Answer: C) 47

Question 11

B cao (62.5); use the midpoint of each class **B1**

Answer: B) 62.5

Question 12

E cao (0.04); multiply along the branches; add the matching routes **B1**

Answer: E) 0.04

Question 13

C cao (1/6); list the equally likely outcomes and count the favourable ones **B1**

Answer: C) 1/6

Question 14

A cao (40); mean x number of values = total **B1**

Answer: A) 40

Question 15

D cao (57); find each total, add them, divide by the total number **B1**

Answer: D) 57

Question 16

B cao (21.125); use the midpoint of each class **B1**

Answer: B) 21.125

Question 17

E cao (5/14); multiply along the branches; add the matching routes **B1**

Answer: E) 5/14

Question 18

(a) 4/10 x 3/9 seen **M1**

(a) 2/15 cao (simplified from 12/90) **A1**

(a) Answer: 2/15

(b) P(both black) = 6/10 x 5/9 = 30/90 (= 1/3) seen **M1**

(b) adds P(both blue) from part a to P(both black), dependent on previous method **M1**

(b) 7/15 cao (from 42/90) **A1**

(b) Answer: 7/15

Question 19

A cao (5/36); list the equally likely outcomes and count the favourable ones **B1**

Answer: A) 5/36

Question 20

B cao (20); mean x number of values = total **B1**

Answer: B) 20

Question 21

C cao (65); find each total, add them, divide by the total number **B1**

Answer: C) 65

Question 22

E cao (35.4); use the midpoint of each class **B1**

Answer: E) 35.4

Question 23

D cao (0.07); multiply along the branches; add the matching routes **B1**

Answer: D) 0.07

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Question 24

A cao (5/36); list the equally likely outcomes and count the favourable ones **B1**

Answer: A) 5/36

Question 25

E cao (33); mean x number of values = total **B1**

Answer: E) 33

Question 26

B cao (57); find each total, add them, divide by the total number **B1**

Answer: B) 57

Question 27

D cao (75); use the midpoint of each class **B1**

Answer: D) 75

Question 28

C cao (2/7); multiply along the branches; add the matching routes **B1**

Answer: C) 2/7

Question 29

D cao (18); mean x number of values = total **B1**

Answer: D) 18

Question 30

A cao (71); find each total, add them, divide by the total number **B1**

Answer: A) 71

Question 31

C cao (60.6); use the midpoint of each class **B1**

Answer: C) 60.6

Question 32

E cao (1/18); list the equally likely outcomes and count the favourable ones **B1**

Answer: E) 1/18

Question 33

D cao (12); mean x number of values = total **B1**

Answer: D) 12

Question 34

C cao (64); find each total, add them, divide by the total number **B1**

Answer: C) 64

Question 35

E cao (47.5); use the midpoint of each class **B1**

Answer: E) 47.5

Question 36

A cao (0.12); multiply along the branches; add the matching routes **B1**

Answer: A) 0.12

Question 37

B cao (24); mean x number of values = total **B1**

Answer: B) 24

Question 38

E cao (47); find each total, add them, divide by the total number **B1**

Answer: E) 47

Question 39

D cao (94); use the midpoint of each class **B1**

Answer: D) 94

Question 40

C cao (0.54); multiply along the branches; add the matching routes **B1**

Answer: C) 0.54

Question 41

A cao (1/12); list the equally likely outcomes and count the favourable ones **B1**

Answer: A) 1/12

Question 42

B cao (17); mean x number of values = total **B1**

Answer: B) 17

Question 43

A cao (52); find each total, add them, divide by the total number **B1**

Answer: A) 52

Question 44

D cao (42); use the midpoint of each class **B1**

Answer: D) 42

Question 45

B cao (0.21); multiply along the branches; add the matching routes **B1**

Answer: B) 0.21

Question 46

C cao (1/12); list the equally likely outcomes and count the favourable ones **B1**

Answer: C) 1/12

Question 47

C cao (54); find each total, add them, divide by the total number **B1**

Answer: C) 54

Question 48

E cao (64); find each total, add them, divide by the total number **B1**

Answer: E) 64

Question 49

D cao (32.8); use the midpoint of each class **B1**

Answer: D) 32.8

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Question 50

A cao (0.09); multiply along the branches; add the matching routes **B1**

Answer: A) 0.09

Question 51

A cao (3/8); list the equally likely outcomes and count the favourable ones **B1**

Answer: A) 3/8

Question 52

E cao (24); mean x number of values = total **B1**

Answer: E) 24

Question 53

D cao (59); find each total, add them, divide by the total number **B1**

Answer: D) 59

Question 54

B cao (23.5); use the midpoint of each class **B1**

Answer: B) 23.5

Question 55

D cao (28/45); multiply along the branches; add the matching routes **B1**

Answer: D) 28/45

Question 56

B cao (3/8); list the equally likely outcomes and count the favourable ones **B1**

Answer: B) 3/8

Question 57

E cao (5); mean x number of values = total **B1**

Answer: E) 5

Question 58

A cao (47); find each total, add them, divide by the total number **B1**

Answer: A) 47

Question 59

C cao (13.4); use the midpoint of each class **B1**

Answer: C) 13.4

Question 60

C cao (0.16); multiply along the branches; add the matching routes **B1**

Answer: C) 0.16

Question 61

D cao (1/2); list the equally likely outcomes and count the favourable ones **B1**

Answer: D) 1/2

Question 62

B cao (71); find each total, add them, divide by the total number **B1**

Answer: B) 71

Question 63

A cao (62.2); use the midpoint of each class **B1**

Answer: A) 62.2

Question 64

D cao (21/55); multiply along the branches; add the matching routes **B1**

Answer: D) 21/55

Question 65

A cao (1/18); list the equally likely outcomes and count the favourable ones **B1**

Answer: A) 1/18

Question 66

C cao (30); mean x number of values = total **B1**

Answer: C) 30

Question 67

E cao (64); find each total, add them, divide by the total number **B1**

Answer: E) 64

Question 68

B cao (44.8); use the midpoint of each class **B1**

Answer: B) 44.8

Question 69

D cao (0.12); multiply along the branches; add the matching routes **B1**

Answer: D) 0.12

Question 70

C cao (5/36); list the equally likely outcomes and count the favourable ones **B1**

Answer: C) 5/36

Question 71

A cao (17); mean x number of values = total **B1**

Answer: A) 17

Question 72

B cao (61); find each total, add them, divide by the total number **B1**

Answer: B) 61

Question 73

E cao (9.25); use the midpoint of each class **B1**

Answer: E) 9.25

Question 74

D cao (1/45); multiply along the branches; add the matching routes **B1**

Answer: D) 1/45

Question 75

C cao (3/8); list the equally likely outcomes and count the favourable ones **B1**

Answer: C) 3/8

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Question 76

E cao (64); find each total, add them, divide by the total number **B1**

Answer: E) 64

Question 77

B cao (40.4); use the midpoint of each class **B1**

Answer: B) 40.4

Question 78

A cao (1/10); multiply along the branches; add the matching routes **B1**

Answer: A) 1/10

Question 79

B cao (1/6); list the equally likely outcomes and count the favourable ones **B1**

Answer: B) 1/6

Question 80

E cao (26); mean x number of values = total **B1**

Answer: E) 26

Question 81

D cao (63); find each total, add them, divide by the total number **B1**

Answer: D) 63

Question 82

C cao (59.5); use the midpoint of each class **B1**

Answer: C) 59.5

Question 83

D cao (35/66); multiply along the branches; add the matching routes **B1**

Answer: D) 35/66

Question 84

B cao (1/36); list the equally likely outcomes and count the favourable ones **B1**

Answer: B) 1/36

Question 85

E cao (24); mean x number of values = total **B1**

Answer: E) 24

Question 86

C cao (70); find each total, add them, divide by the total number **B1**

Answer: C) 70

Question 87

A cao (29); use the midpoint of each class **B1**

Answer: A) 29

Question 88

E cao (0.38); multiply along the branches; add the matching routes **B1**

Answer: E) 0.38

Question 89

A cao (1/16); list the equally likely outcomes and count the favourable ones **B1**

Answer: A) 1/16

Question 90

B cao (50); find each total, add them, divide by the total number **B1**

Answer: B) 50

Question 91

D cao (39.5); use the midpoint of each class **B1**

Answer: D) 39.5

Question 92

A cao (0.05); multiply along the branches; add the matching routes **B1**

Answer: A) 0.05

Question 93

B cao (1/4); list the equally likely outcomes and count the favourable ones **B1**

Answer: B) 1/4

Question 94

E cao (19); mean x number of values = total **B1**

Answer: E) 19

Question 95

D cao (51); find each total, add them, divide by the total number **B1**

Answer: D) 51

Question 96

C cao (13.5); use the midpoint of each class **B1**

Answer: C) 13.5

Question 97

B cao (0.63); multiply along the branches; add the matching routes **B1**

Answer: B) 0.63

Question 98

E cao (1/36); list the equally likely outcomes and count the favourable ones **B1**

Answer: E) 1/36

Question 99

B cao (23); mean x number of values = total **B1**

Answer: B) 23

Question 100

A cao (45); find each total, add them, divide by the total number **B1**

Answer: A) 45

Question 101

C cao (92.4); use the midpoint of each class **B1**

Answer: C) 92.4

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Question 102

D cao (14/33); multiply along the branches; add the matching routes **B1**

Answer: D) 14/33

Question 103

D cao (15); mean x number of values = total **B1**

Answer: D) 15

Question 104

E cao (59); find each total, add them, divide by the total number **B1**

Answer: E) 59

Question 105

B cao (53); use the midpoint of each class **B1**

Answer: B) 53

Question 106

A cao (16/45); multiply along the branches; add the matching routes **B1**

Answer: A) 16/45

Question 107

A cao (26); mean x number of values = total **B1**

Answer: A) 26

Question 108

B cao (62); find each total, add them, divide by the total number **B1**

Answer: B) 62

Question 109

C cao (11.25); use the midpoint of each class **B1**

Answer: C) 11.25

Question 110

D cao (6/11); multiply along the branches; add the matching routes **B1**

Answer: D) 6/11

Question 111

C cao (1/36); list the equally likely outcomes and count the favourable ones **B1**

Answer: C) 1/36

Question 112

E cao (1); mean x number of values = total **B1**

Answer: E) 1

Question 113

D cao (67); find each total, add them, divide by the total number **B1**

Answer: D) 67

Question 114

A cao (31.5); use the midpoint of each class **B1**

Answer: A) 31.5

Question 115

C cao (0.06); multiply along the branches; add the matching routes **B1**

Answer: C) 0.06

Question 116

B cao (3/4); list the equally likely outcomes and count the favourable ones **B1**

Answer: B) 3/4

Question 117

C cao (60); find each total, add them, divide by the total number **B1**

Answer: C) 60

Question 118

(a) 0.4 x 0.4 seen **M1**

(a) 0.16 cao **A1**

(a) Answer: 0.16

(b) identifies the two ways this can happen, red-then-blue and blue-then-red, each with probability 0.4 x 0.6 = 0.24 **M1**

(b) adds the two probabilities, dependent on previous method **M1**

(b) 0.48 cao **A1**

(b) Answer: 0.48

(c) P(no red) = 0.6 x 0.6 = 0.36 seen **M1**

(c) 0.64 cao, ft from their P(no red) **A1**

(c) Answer: 0.64

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