Final Exam Option 1 Answers

Multiple Choice and Numerical Response Answers

1. D
2. B
3. 4
4. C
5. C
6. D
7. A
8. $284
9. C
10. D
11. 800 m
12. $56
13. B
14. B
15. B
16. B
17. C
18. C
19. D
20. B
21. 24
22. B
23. A
24. D
25. D
26. A
27. A
28. B
29. C
30. C
31. D
32. D
33. 0.6
34. A
35. B
36. D
37. B
38. 2431
39. B
40. B
41. B
42. C
43. 1423
44. A
45. D
46. C
47. A
48. A
49. D
50. A
51. D
52. C
53. B
54. B
55. C
56. 2.4
57. B
58. A
59. D
60. 2.25

Written Response Answers

1. a) $l = 2x;\ w = 2x;\ h = 8$
$V = (2x)(2x)(8)$
$V = 32x^2$

b) $288 = 32x^2$
$\frac{288}{32} = \frac{32}{32}x^2$
$9 = x^2$
$\sqrt{9} = \sqrt{x}$
$x = 3$
The dimensions of the right prism are 8 cm by 6 cm by 6 cm.

c) Since $2x$ represents the diameter and if $x = 3$, then the diameter $= 2(3) = 6$ cm. One half the diameter = radius. The radius = 3 cm; the height = 8 cm.
$SA = 2(3.14)(3)^2 + 2(3.14)(3)(8)$
$= 207.2 \text{ cm}^2$
The surface area of the right cylinder is approximately 207.2 cm^2.

2. a) She is correct. However, Jeanine assumes that she runs at a steady pace. Many trained athletes are able to predict their speed but people just starting to train are less likely to run at a consistent rate.

b) approximately 25 min

c) $d = \frac{1}{5}t$ or $d = \frac{t}{5}$

d)
$$d = \frac{1}{5}t$$
$$10 = \frac{1}{5}t$$
$$5 \times 10 = 5 \times \frac{1}{5}t$$
$$50 = t$$

At Jeanine's current rate, she will complete the run in exactly 50 min; in theory, she will therefore not achieve her goal. Students may present arguments such as the following:

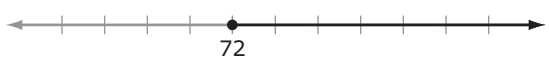
- She is unlikely to maintain a consistent pace and slow down at times. Therefore, she will not achieve her goal.
- She may run at a slightly faster pace to achieve her goal, since she is so close to reaching it.

Students should support their argument mathematically.

3. a) First, multiply by the reciprocal: $-\frac{2}{3} \times \frac{8}{5}$. Next, multiply the answer by $-\frac{4}{5}$. The final solution will be positive.

b)
$$-\frac{2}{3} \times \frac{4}{3} = -\frac{8}{9}$$
$$-\frac{5}{6} + -\frac{8}{9} = \frac{-5 \times 3}{6 \times 3} + \frac{-8 \times 2}{9 \times 2}$$
$$\frac{-15}{18} + \frac{-16}{18} = \frac{-31}{18} \text{ or } -1\frac{13}{18}$$

c)



d)
$$20\frac{3}{4}(2r - 6) = 20\frac{1}{5}(36 + r)$$
$$15(2r - 6) = 4(36 + r)$$
$$30r - 90 = 144 + 4r$$
$$30r - 4r - 90 = 144 + 4r - 4r$$
$$26r - 90 + 90 = 144 + 90$$
$$26r = 234$$
$$r = 9$$

e) $3^3 - 9 = 27 - 9 = 18$

4. a) A spectator has an equal chance of choosing any one of 15 squares. The theoretical probability is $\frac{1}{15}$ or 6.67%.

b) Divide the total people by the number of squares: $\frac{195}{15} = 13$. A square that has more than 13 people on it is overcrowded. Students might use the population, count the people on each square, determine which squares are overcrowded, and determine the percent this represents of the total area. Alternatively, they might take a random sample of 5 squares to determine overcrowding and then extrapolate to the population.

Example: Using a random sample of 5 squares, such as the top row of the image, moving from left to right, the number of spectators is: 9, 10, 14, 11, and 10. Only one square is overcrowded. In conclusion, in general, there is no problem with overcrowding. The area seems to accommodate the spectators comfortably.