Final Exam Option 1 Answers

Multiple Choice and Numerical Response Answers

1. C
2. 68°
3. C
4. A
5. B
6. D
7. A
8. D
9. B
10. B
11. C
12. D
13. B
14. C
15. 165 ft^2
16. B
17. C
18. B
19. 1620 $in.^3$
20. D
21. C
22. 14.9°
23. B
24. C
25. B
26. $9.09
27. 17.2 m
28. D
29. A
30. B
31. 13.8 mm
32. C
33. C
34. B
35. B
36. A
37. 24
38. A
39. B
40. D
41. 3124
42. D
43. D
44. 3
45. C
46. 21
47. B
48. D
49. 30
50. 29.5°
51. A
52. B
53. D
54. A
55. D
56. B
57. D
58. A
59. 0.5
60. A

Written Response Answers

1. a) $4\sqrt{30^2 + 20^2} = 144.222\,204$
The amount of cable needed is approximately 144 m.

b) $\tan\theta = \left(\frac{30}{20}\right)$
$\theta = 56.309\,932\ldots$
$\theta = 56.3$
The angle is approximately 56.3°.

c) $\frac{-30}{20} = -1.5$

d) $y = -1.5x + 30$; in general form:
$5x = 2y - 60 = 0$

2. a) $V = \pi\,(30^2)(80)$
$V = 226\,194.690\,265\ldots$
The volume of the barrel is approximately 226 195 cm^3.

b) $V = \pi\,(3^2)(12)$
$V = 339.292\,035\ldots$
The volume of the spigot is approximately 339 cm^2.

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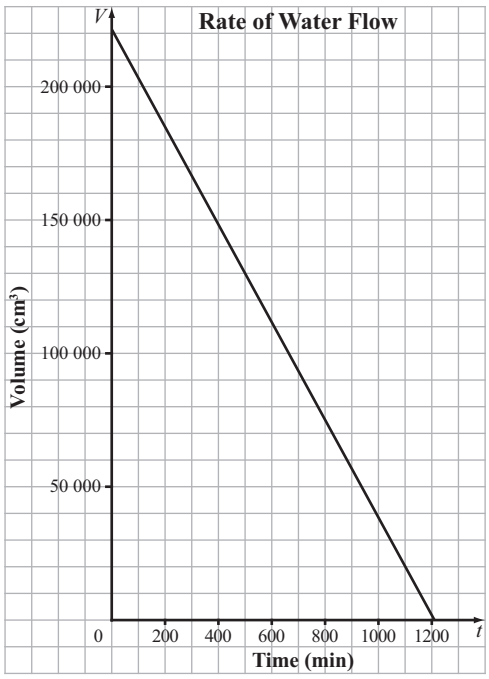
c)



d) $\frac{1}{4}(226\,195) = 56\,548.75$;

$\frac{56\,549}{200} = 282.745$

It would take approximately 283 s or 4.7 min before the barrel was three quarters full. Alternatively, students may use the graph in part c) to determine the time.

e) Bryan is correct. The slope is decreasing (or negative). As time passes, the level of the water in the barrel decreases.

f) $V_{\text{ball}} = \frac{4}{3}\pi(6)^3$

$V_{\text{ball}} = 904.778\,761\,061\,947\ldots$

The volume of the ball is approximately 905 cm^3.

$h = \frac{V}{\pi r^2}$

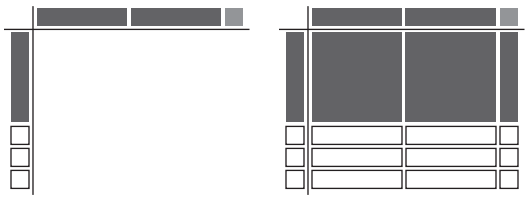
$h = \frac{905}{900\pi}$

$h = \frac{905}{2827.433\,628\ldots}$

$h = 0.320\,078\ldots$

The level of the water rose about 0.32 cm after the ball sank.

3. a) Diagrams may vary. Example:



b) $2x^2 - 5x - 3$

c) Answers will vary. Students may represent a linear or a non-linear relation.

d) Answers will vary. Check that the graph passes the vertical line test.

e) Answers will vary. Check that the graph does not pass the vertical line test.