Final Exam Option 1 Answers

Multiple Choice and Numerical Response Answers

1. C
2. D
3. C
4. C
5. 34.5 m
6. 11 m
7. D
8. 80.7 m^2
9. D
10. B
11. C
12. C
13. B
14. B
15. B
16. D
17. B
18. D
19. D
20. B
21. B
22. 3072 cm^3
23. A
24. B
25. C
26. C
27. C
28. B
29. 80 m^3
30. C
31. D
32. D
33. A
34. A
35. 30
36. B
37. C
38. A
39. 432%
40. A
41. 0.05
42. A
43. D
44. B
45. C
46. B
47. D
48. A
49. D
50. 6400
51. C
52. A
53. D
54. 576
55. B
56. C
57. D
58. D
59. D
60. 15°C

Written Response Answers

1. a) 25

b) Bacteria are present in 25 samples. There are 100 samples. So, 75 samples have no bacteria present.

75 out of 100 as a fraction is $\frac{75}{100}$ or $\frac{3}{4}$
as a decimal is 0.75
as a percent is 75%

c) $\frac{81}{678} \approx 0.1195$
$0.1195 \times 100 = 11.95\%$
Samples with bacteria present are 11.95%.
11.95% is less than 15%, so the water is safe to use.

d) Examples:
- I recommend that 1000 more samples be taken and the percent with bacterial present be re-calculated because 11.95% is close to 15%.
- I recommend that people take precautions, like boiling their water before drinking it, because 11.95% is still quite high.
- It is safe to use the water because 11.95% is less than 15%.

2. a) height to width = 10:1
but width = 2 m
so, height:2 = 10:1
The height would be 20 m.

b) Volume of a cylinder
$= \pi r^2 h$
$\approx 3.14 \times (1)^2 \times 20$
≈ 62.8
The volume is 62.8 m^3.

c) The top face is a rectangle 20 m by 4 m.
Area of the top face is $20 \times 4 = 80$
Each end face is a rectangle 8 m by 4 m.
Area of an end face is $8 \times 4 = 32$
The front and back faces are both rectangles 20 m by 8 m less a triangle.
The base of the triangle is 12 m.
The height of the triangle is 8 m – 2 m or 6 m.

$$\text{Area of the triangle} = \frac{1}{2} \times b \times h$$
$$= \frac{1}{2} \times 12 \times 6$$
$$= 36$$

Area of a rectangle is $20 \times 8 = 160$
Area of a front or back face is $160 - 36 = 124$
Surface area of the top face, two end faces, and front and back faces of the arch is $80 + (32 \times 2) + (124 \times 2) = 80 + 64 + 248 = 392$
The surface area is 392 m^2.

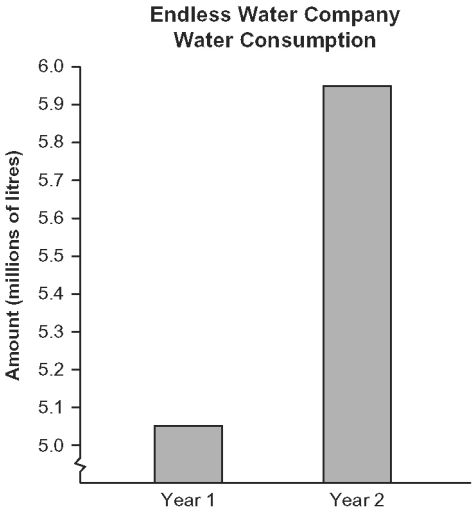
3. a) Pythagorean relationship
$c^2 = a^2 + b^2$ where c is the hypotenuse of a right triangle and a and b are the legs.

b)
$$c^2 = a^2 + b^2$$
$$25^2 = 20^2 + w^2$$
$$625 - 400 = w^2$$
$$225 = w^2$$
$$\sqrt{225} = w^2$$
$$15 = w$$

The width of the river is 15 m.

c) Let the distance from the surveyor to the pumphouse be c.
$c^2 = a^2 + b^2$
$c^2 = 30^2 + 15^2$
$c^2 = 900 + 225$
$c^2 = 1125$
$c \approx 33.5$
The distance from the surveyor to the pumphouse is 33.5 m.

d) Example:
I would change the vertical scale. I would show a break in the axes, start at 5.0 (million litres), have the scale go only to 6.0 (million litres) and show marks of 5.1, 5.2, and so on.



This makes the consumption appear to be more of an increase from Year 1 to Year 2 than the Endless Water Company's graph does.

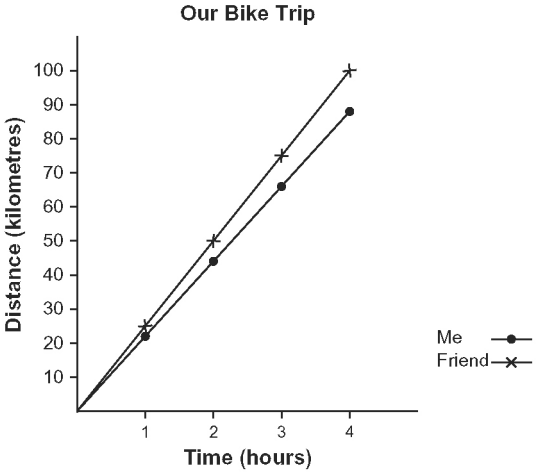
4. a) 22, 44, 66, 88

b) $D = 25t$ where D is the distance in kilometres and t the time in hours

c)

t	*D*
1	25
2	50
3	75
4	100

d) Example:
I would use a double line graph and make each bicycler's line a different colour.



e) If it is $\frac{2}{5}$ full, then I add $\frac{3}{5}$ to fill it.

$\frac{3}{5}$ of 750 = 450

I add 450 mL of water to fill the bottle.

f) Examples:

- $\frac{13-25}{6} = \frac{-12}{6}$
  $= -2$
- $\frac{25-13}{6} = \frac{12}{6}$
  $= 2$