More Mining Math

Formulas for these questions can be found here:
http://www.usmra.com/repository/category/ventilation/Ventilation_Math_III.ppt
http://www.usmra.com/repository/category/mine_drainage/mine_drainage.ppt

1. Determine the perimeter of an entry 18 feet across the top, 19 feet across the bottom, and 6 feet high.

   a. 44.91 feet
   b. 94.17 feet
   c. 58.68 feet
   d. 49.04 feet

2. Determine the perimeter of an entry 20 feet across the top, 23 feet across the bottom, and 5 feet 6 inches high.

   a. 48.6 feet
   b. 54.4 feet
   c. 62.7 feet
   d. 78.6 feet

3. Determine the perimeter of an entry 17 feet across top, 20 feet across bottom, and 4 feet high.

   a. 45.54 feet
   b. 52.64 feet
   c. 61.27 feet
   d. 75.63 feet

4. A mast is 50 feet high, the anchor pin is 30 feet away. How much wire rope is needed to secure the top of the mast to the anchor pin?

   a. 39.2 feet
   b. 46.8 feet
   c. 58.3 feet
   d. 62.7 feet

5. What is the depth of the air shaft, if the Barometer reads 29.75 inches at top of the shaft and 30.95 inches at the bottom?

   a. 850.5 feet
   b. 1,012.5 feet
   c. 1,051.2 feet
   d. 1,512.5 feet

6. What is the depth of the air shaft, if the Barometer reads 29.35 inches at top of the shaft and 29.65 inches at the bottom?

a. 468.2 feet
b. 386.8 feet
c. 268.2 feet
d. 262.8 feet

7. An entry is 10 feet high and 22 feet wide with a total length of 2,000 feet. What is the rubbing surface?

a. 128,000 square feet
b. 228,000 square feet
c. 328,000 square feet
d. 428,000 square feet

8. An entry is 12 feet high and 18 feet 6 inches wide with a length of 1,500 feet. What is the rubbing surface?

a. 91,500 square feet
b. 81,500 square feet
c. 71,500 square feet
d. 61,500 square feet

9. An entry is 5 feet high and 19 feet wide and 1,750 feet long. What is the rubbing surface?

a. 84,000 square feet
b. 94,000 square feet
c. 104,000 square feet
d. 114,000 square feet

10. An entry measures 18 feet across the top and 22 feet across the bottom and 10 feet high with a length of 3,000 feet. What is the rubbing surface?

a. 191,140 square feet
b. 181,140 square feet
c. 171,140 square feet
d. 161,140 square feet

11. What is the rubbing surface of a circular shaft 3,500 feet long with a diameter of 18 feet?

a. 137,280.9 square feet
b. 165,380.9 square feet
c. 178,890.8 square feet
d. 197,920.8 square feet

12. What is the rubbing surface of a circular shaft 2,500 feet long with a diameter of 15 feet 6 inches?

a. 153,115 square feet
b. 142,737 square feet
c. 137,737 square feet
d. 121,737 square feet

13. A return airway has a quantity of 11,000 CFM, which has 0.4% CH_4 gas. What is the quantity of gas?

a. 44 CFM
b. 38 CFM
c. 66 CFM
d. 36 CFM

14. A return airway has a quantity of 32,000 CFM, which has 0.1% CH_4 gas. What is the quantity of gas?

a. 27 CFM
b. 32 CFM
c. 54 CFM
d. 66 CFM

15. A return airway has a quantity of 17,500 CFM, which has 2.0% CH_4 gas. What is the quantity of gas?

a. 290 CFM
b. 350 CFM
c. 420 CFM
d. 510 CFM

16. A return airway has a quantity of 12,500 CFM, with 110 CFM CH_4. What is the percentage of gas?

a. 0.58%
b. 0.68%
c. 0.78%
d. 0.88%

17. A return leg of an air shaft has a diameter of 17 feet, with a velocity of 180 FPM, and a quantity of gas of 75 CFM CH_4. What is the percentage of gas?

a. 0.18%
b. 0.28%
c. 0.38%
d. 0.48%

18. The quantity of gas in the return airway was 120 CFM with 2.0% CH_4. What was the quantity?

a. 8,000 CFM
b. 7,000 CFM
c. 6,000 CFM
d. 5,000 CFM

19. The quantity of gas in the return airway was 95 CFM with 0.5% CH_4. What was the quantity?

a. 19,000 CFM
b. 18,000 CFM
c. 17,000 CFM
d. 16,000 CFM

20. A mine entry measured 10' high and 20' wide and the anemometer reading was 150 FPM, the methane reading was 1.0%. What is quantity of gas liberated in a 24 hour period?

a. 486,000 CFM
b. 423,000 CFM
c. 432,000 CFM
d. 468,000 CFM

21. The quantity of return air was 10,500 CFM and found to contain 2.3% CH_4. How much extra air is needed to reduce the methane content to 1.5%.

a. 6,000 CFM
b. 5,600 CFM
c. 4,800 CFM
d. 4,000 CFM

22. The quantity of return air was 14,500 CFM and found to contain 3.4% CH_4. What is the total volume needed to reduce the methane content to 2.0%.

a. 52,560 CFM
b. 42,650 CFM
c. 38,560 CFM
d. 24,650 CFM

23. If the new section requires 18,000 CFM and the water gauge is 1.2 inches, what size does the regulator need to be?

a. 4.6 square feet
b. 6.6 square feet
c. 6.8 square feet
d. 8.6 square feet

24. If a new section requires 17,500 CFM and the water gauge is 2.8 inches, what size does the regulator need to be?

a. 5.89 square feet
b. 4.19 square feet
c. 4.79 square feet
d. 6.19 square feet

25. Calculate the volume of a rectangular sump with a length of 25 feet, a width of 10 feet and a depth of 15 feet.

a. 7,500 cubic feet
b. 6,000 cubic feet
c. 5,750 cubic feet
d. 3,750 cubic feet

26. Calculate the volume of a rectangular sump with a length of 50 feet, a width of 25 feet and a depth of 15 feet.

a. 18,750 cubic feet
b. 22,750 cubic feet
c. 28,750 cubic feet
d. 38,750 cubic feet

27. Calculate the volume of a cylinder with a radius of 5 feet and a depth of 15 feet.

a. 1,178 cubic feet
b. 2,178 cubic feet
c. 3,178 cubic feet
d. 4,178 cubic feet

28. Calculate the volume of a cylindrical storage tank with a radius of 10 feet and a depth of 30 feet.

a. 7,424.8 cubic feet
b. 8,424.8 cubic feet
c. 9,424.8 cubic feet
d. 10,424.8 cubic feet

29. Calculate the volume of a cylindrical storage tank with a diameter of 10 feet and a depth of 30 feet.

a. 1,127 cubic feet
b. 2,355 cubic feet
c. 3,533 cubic feet
d. 4,655 cubic feet

30. Calculate the volume of a triangle with a base of 8 feet, a height of 5 feet and a length of 8 feet.

a. 320 cubic feet
b. 280 cubic feet
c. 220 cubic feet
d. 160 cubic feet

31. Calculate the volume of a triangle with a base of 15 feet, a height of 10 feet and a length of 12 feet.

a. 600 cubic feet
b. 700 cubic feet
c. 800 cubic feet
d. 900 cubic feet

32. Calculate the volume of a triangle with a base of 20 feet, a height of 15 feet and a length of 10 feet.

a. 4,500 cubic feet
b. 3,000 cubic feet
c. 1,500 cubic feet
d. 500 cubic feet

33. Calculate the volume of a sphere with a diameter of 15 feet.

a. 2,767.15 cubic feet
b. 1,767.15 cubic feet
c. 3,767.15 cubic feet
d. 4,767.15 cubic feet

34. Calculate the volume of sphere with a diameter of 20 feet.

a. 4,187 cubic feet
b. 6,187 cubic feet
c. 8,187 cubic feet
d. 9,187 cubic feet

35. Calculate the volume of sphere with a diameter of 12.5 feet.

a. 2,022 cubic feet
b. 3,022 cubic feet
c. 1,022 cubic feet
d. 1,022 cubic yards