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1. Convert 1000 ft^3 to cu. yards

$$1000\cancel{ft^3} * \frac{cu.yards}{27\cancel{ft^3}} = 37cu.yards$$

2. Convert 10 gallons/min to ft^3/hr

$$\frac{10\cancel{gallons}}{\cancel{min}} * \frac{ft^3}{7.48\cancel{gallons}} * \frac{60\cancel{min}}{hr} = \frac{80.2ft^3}{hr}$$

3. Convert 100,000 ft^3 to acre-ft.

$$100,000\cancel{ft^3} * \frac{acre-ft}{43,560\cancel{ft^2-ft}} = 2.3acre-ft$$

Note: From the conversion table: acre = 43,560 ft^2

Thus, acre-ft = 43,560 ft^2 -ft or 43,560 ft^3

4. Find the flow in gpm when the total flow for the day is 65,000 gpd.

$$\frac{65,000gpd}{1,440 \text{ min/day}} = 45gpm$$

5. Find the flow in gpm when the flow is 1.3cfs.

$$1.3 \frac{cfs}{1} \times \frac{448gpm}{1cfs} = 582gpm$$

6. Find the flow in gpm when the flow is 0.25cfs.

$$0.25 \frac{cfs}{1} \times \frac{448gpm}{1cfs} = 112gpm$$

7. Convert 22°C into degree Fahrenheit.

8. Convert 56°C into degree Celsius.

9. Convert 45 psi to feet of head

$$45 \cancel{psi} * \frac{ft \text{ head}}{0.433\cancel{psi}} = \boxed{92.4 \text{ feet}}$$

10. convert 3 miles to cm

Solution:

$$3 \cancel{miles} * \frac{5,280 \cancel{ft}}{\cancel{mile}} * \frac{30.48 \text{ cm}}{\cancel{ft}} = \boxed{482,803 \text{ cm}}$$

11. The water flow to a treatment plant has a velocity of 61 cm/s. What is this velocity expressed in ft/min. Given: 1 ft = 30.48 cm

Solution:

$$61 \frac{\cancel{cm}}{\cancel{s}} * \frac{ft}{30.48 \cancel{cm}} * \frac{60 \cancel{s}}{min} = \boxed{120 \text{ ft/min}}$$

12. The wastewater flow to a treatment plant has a velocity of 61 cm/s. What is this velocity expressed in ft/min.

(1 ft = 30.48 cm)

$$61 \frac{\cancel{cm}}{\cancel{s}} * \frac{ft}{30.48 \cancel{cm}} * \frac{60 \cancel{s}}{min} = \boxed{120 \text{ ft/s}}$$

Correct Answer(s):

a. 120.0

13. The velocity of the wastewater flow through a grit chamber is 62 ft/min. What is the velocity expressed in inches per second.

$$\text{Velocity in } \frac{\text{in}}{\text{sec}} = 62 \frac{\text{ft}}{\text{min}} * \frac{12 \text{ in}}{\text{ft}} * \frac{\text{min}}{60 \text{ sec}} = \boxed{12.4 \frac{\text{in}}{\text{sec}}}$$

14. Convert 1.7 MGD to ft³/s

Correct Answer(s):

15. Convert 100 Ac-ft to MG

Correct Answer(s):

a. 32.6

16. Convert 3.5 cu. ft/s to MGD

Correct Answer(s):

a. 2.26

17. Sludge with a sludge density of 7% would have a solids concentration of

a. 7 mg/l

b. 700 mg/l

c. 7000 mg/l

*d. 70,000 mg/l

18. As an operator of a wastewater plant you are treating a flow of 21 MGD, what is the flow in gallons per minute?

a. 1,458

b. 5,833

c. 8,750

d. 14,583

e. 87,500 Solution:

$$\frac{21 \text{ MG}}{\text{day}} * \frac{1,000,000 \text{ gal}}{\text{MG}} * \frac{\text{day}}{24 * 60 \text{ min}} = \boxed{\frac{14,583 \text{ gal}}{\text{min}}}$$

19. Given 1 ft = 30.48 cm and 5,280 ft = mile, convert 3 miles to cm

Solution:

$$3 \text{ miles} * \frac{5,280 \text{ ft}}{\text{mile}} * \frac{30.48 \text{ cm}}{\text{ft}} = \boxed{482,803 \text{ cm}}$$

20. The wastewater flow to a treatment plant has a velocity of 61 cm/s. What is this velocity expressed in ft/min. Given: 1 ft = 30.48 cm

Solution:

$$61 \frac{\text{cm}}{\text{s}} * \frac{\text{ft}}{30.48 \text{ cm}} * \frac{60 \text{ s}}{\text{min}} = \boxed{120 \text{ ft/min}}$$

21. Convert 8.0cfs to gpm.

a. 1.07gpm

b. 64.2gpm

c. 480gpm 8×449

(e.) 3,436gpm

22. Conyert 4,000 gpm to cfs.

- a. 8.91cfs
- b. 66.65cfs
- c. 499cfs
- d. 535cfs
- e. 32,076cfs

23. Convert 12MGD to gpm.

- a. 0.00833gpm
- b. 7,200gpm 12×700
- d. 17,280gpm
- e. 199,992gpm

24. Convert 5.5 cfs to MGD.

- a. 0.059MGD
- b. 0.148 MGD
- c. 0.475MGD
- (64) more Aaumole
- e. 7,920 MGD

25. Convert 45 Acre-feet into million gallons.

- a. 6.02Mgal
- b. 1.96Mgal
- c. 14.7Mgal
- d. 45Mgal
- e. 336.6Mgal

26. Convert 6.5 feet per second into miles per hour.

- a. 4.43mph
- c. 13.3mph
- d. 106mph
- e. 266mph

27. Convert 3.4 miles into feet.

- a. 5,000 feet
- b. 5,280 feet
- c. 5,984 feet
- d. 10,000 feet
- (e.) 17,952 feet

$$= \frac{6.5/5280}{1/60 \times 60}$$

$$1 \text{ m/e} = 25 \text{ ft}$$

28. Convert 2,250gpm into MGD.

-
- a. 0.054MGD
 - b. 3.24MGD
 - d. 2,250MGD
 - e. 3,240 MGD

29. Convene 9.75MGD into cfs.

- a. 15.1cfs
- b. 37.75cfs
- c. 113cfs
- d. 363cfs
- e. 845cfs

$$236\pi$$

30. Convert 1,000,000 cubic feet into Acre-feet.

- a. 0.04356AF
- b. 0.325829AF
- c. 3.07AF
- d. 22.96AF
- e. 172AF

31. If exactly 100gal of polymer costs \$19.50, what will 5,500gal cost, assuming no quantity discount?

$$\frac{19.50}{100} \times 5500 = 1,072.5$$

32. A room measures 12ft high, 30 ft long, and 17 ft wide. How many cubic feet per minute of air must a blower in an air exchange unit move to completely change the air every 10 minutes?

- a. 102
- b. 612
- c. 1,020
- d. 6,120

33. 500 GPM is how many gallons per houl?

10560

$$\frac{500 \text{ g}}{1 \text{ m}} = \frac{500}{1/10h} = \text{Ans } \frac{30 \text{ e0r}}{\text{gph}}$$

34. 30,000 gph is how many gallons per day?

$$\frac{30,000 \text{ g}}{h} = \frac{30,000}{1/24} = 30,020 \times 24 \text{ Ans. } \frac{720,010}{\text{gpd}}$$

35. A flow of 25gpm is low many gpd?

$$\frac{25 \text{ g}}{m} = \frac{25}{1/60} \times \frac{1}{24} \quad (25 \times 1440) \text{ Ans. } 36,0w \text{ gpd}$$

36. A flow of 800,000gpd is how many gpm? $\frac{800,000}{0.8MGD \times 700} = 560 \times 24 \times 60 \quad 555.55$
0.80gpm

37. A flow of 150gpm is how many MGD?

700 (wm.

Ans.

MGD

38. Convert 1000 ft^3 to cu. yards

Solution:

39. Convert 10 gallons/min to ft^3 /hr

Solution:

$$\frac{ft^3}{hr} = 10 \frac{\cancel{gal}}{\cancel{min}} * \frac{ft^3}{7.48\cancel{gal}} * \frac{60\cancel{min}}{hr} = \boxed{80.2 \frac{ft^3}{hr}}$$

40. Find the flow in gpm when the flow is 0.25cfs.

Solution:

$$\frac{gal}{min} = 0.25 \frac{\cancel{ft^3}}{\cancel{sec}} * \frac{7.48\cancel{gal}}{\cancel{ft^3}} * \frac{60\cancel{sec}}{min} = \boxed{112.2 \frac{gal}{min}}$$

41. The flow rate through a filter is 4.25 MGD. What is this flow rate expressed as gpm?

Solution:

$$\frac{gal}{min} = 4.25 \frac{\cancel{MG}}{\cancel{day}} * \frac{1,000,000\cancel{gal}}{\cancel{MG}} * \frac{\cancel{day}}{1,440min} = \boxed{2,951 \frac{gal}{min}}$$

42. After calibrating a chemical feed pump, you've determined that the maximum feed rate is 178 mL/minute. If this pump ran continuously, how many gallons will it pump in a full day?

Solution:

$$\frac{gal}{day} = 178 \frac{\cancel{mL}}{\cancel{min}} * \frac{L}{1000\cancel{mL}} * \frac{1,440\cancel{min}}{day} = \boxed{119,680 \frac{gal}{day}}$$

43. A plant produces 2,000 cubic foot of water per hour. How many gallons of water is produced in an 8-hour shift?

Solution:

$$\frac{gal}{8-hr\ shift} = 2,000 \frac{\cancel{ft^3}}{\cancel{hr}} * \frac{7.48\cancel{gal}}{\cancel{ft^3}} * \frac{8\cancel{hr}}{8-hr\ shift} = \boxed{253.6 \frac{gal}{day}}$$

44. Change 70 °F to °C

Solution:

$$^{\circ}C = \frac{^{\circ}F - 32}{1.8} = \frac{70 - 32}{1.8} = \boxed{21.1^{\circ}C}$$

45. Change 4 °C to °F

Solution:

$$^{\circ}F = (^{\circ}C \times 1.8) + 32 = (4 * 1.8) + 32 = \boxed{39.2^{\circ}F}$$