

PAT Sample Questions (NO CALCULATOR) PART II

1.  $-3 - (-4) + (-10)$   
 $= -3 + 4 + (-10)$   
 $= 1 + (-10)$   
 $= -9$

2.  $-7 - 11 + (-9)$   
 $= -18 + (-9)$   
 $= -27$

3.  $12 - (-15) - 7$   
 $= 12 + 15 - 7$   
 $= 20$

4. What is the value of  $2^3 + 2^0$ ?  
 $= 8 + 1$   
 $= 9$

5. What is the value of  $4^2 + 2^5 + 3^0$ ?  
 $= 16 + 32 + 1$   
 $= 49$

Evaluate the following four expressions.

Expression #1

$$-(-2)^3 = +8$$

Expression #2

$$-2^3 = -8$$

Expression #3

$$-(-3)^2 = -9$$

Expression #4

$$-(-3^2) = +9$$

$$-3^2 = -(3)(3) = -9$$

6.

Which numbered expression shown above has the largest value and what is that value?

Expression #4 = +9

7. What is the value of  $\sqrt{\frac{5}{20}}$  expressed as a fraction in simplest form? *← Reduce!*

$$= \sqrt{\frac{1}{4}} = \frac{1}{2}$$

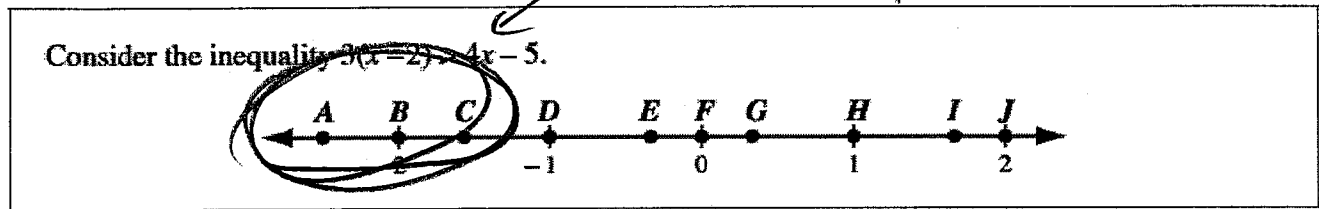
because  $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$  or  $\sqrt{\frac{1}{4}} = \frac{\sqrt{1}}{\sqrt{4}} = \frac{1}{2}$

8. What is the value of  $13.2 + 0.05 - 5.45$ ?

$$= 13.25 - 5.45$$

$$= 7.8$$

9.



How many of the points labelled with a letter on the number line above satisfy the inequality?

$$\begin{aligned} 3x-6 &> 4x-5 \\ -3x & \quad -3x \\ -6 &> x-5 \\ +5 & \quad +5 \\ x &< -1 \end{aligned} \quad \begin{aligned} -1 &> x \\ \text{or} \\ x &< -1 \end{aligned}$$

10. To the nearest whole number, what is the approximate square root of 200?

$$\sqrt{196} = 14$$

14

11. What is 150% of 60?

$$\begin{aligned} 100\% \text{ of } 60 &= 60 \\ 50\% \text{ of } 60 &= 30 \\ 60 + 30 &= \underline{90} \end{aligned}$$

or  $1.5 \times 60 = 90$

12. What is 200% of 300?

$$\begin{aligned} 100\% \text{ of } 300 &\text{ is } 300 \\ 200\% \text{ of } 300 &\text{ is } \underline{\underline{600}} \end{aligned}$$

13. In simplest form, what is the value of

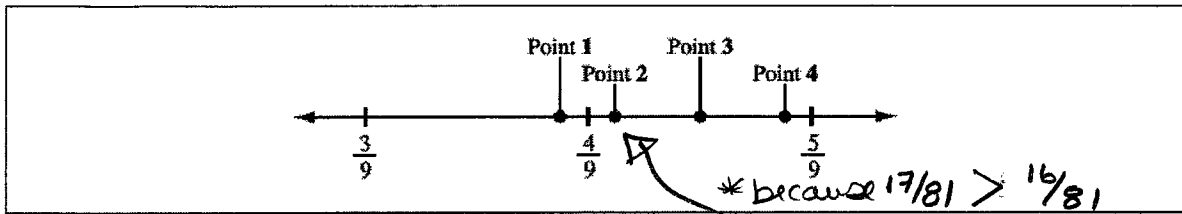
$$\begin{aligned} 4 \times \left( 2 + \frac{3}{4} \right) &= 4(2) + 4\left(\frac{3}{4}\right) \\ &= 8 + 3 \\ &= 11 \end{aligned}$$

14. Simplify, then evaluate

$$\begin{aligned} &\frac{(3^4)^3 \times 3^2}{3 \times 3^{10}} \\ &= \frac{3^{12} \times 3^2}{3 \times 3^{10}} = \frac{3^{14}}{3^{11}} = 3^3 = 27 \end{aligned}$$

15. What is the value of  $-\frac{2}{5} + 0.5 + 0.75$  expressed as a fraction in simplest form?

$$\begin{aligned} &= -0.4 + 0.5 + 0.75 \\ &= 0.1 + 0.75 \\ &= 0.85 = \frac{85}{100} = \frac{17}{20} \end{aligned}$$



16. Which point best represents the location of  $\sqrt{\frac{17}{81}}$  on the number line shown above?

$$\approx \sqrt{\frac{16}{81}} = \frac{\sqrt{16}}{\sqrt{81}} = \frac{4}{9}$$

17. What is the value of  $(2^3 - 3^2)^2$ ?

$$= (8 - 9)^2 = (-1)^2 = (-1)(-1) = +1$$

18. What is the value of  $\sqrt{\frac{1}{9}} \times \sqrt{\frac{36}{49}} \times \sqrt{49\,000\,000}$ ?

$$= \frac{1}{3} \times \frac{6}{7} \times 7000 = \frac{2}{7} \times 7000 = \frac{2 \times 7000}{7} = \frac{14000}{7}$$

19.  $14.8 + 0.02 - 5.83$   
 $= 14.82 - 5.83$   
 $= \underline{\underline{8.99}}$

20.  $2.1 + 0.09 - 1.61$   
 $= 2.19 - 1.61$   
 $= \underline{\underline{0.58}}$

21.  $21.8 - 1.6 + 9.7$   
 $= 20.2 + 9.7$   
 $= \underline{\underline{29.9}}$   
2000

22.  $5^2 + 5^0$   
 $= 25 + 1$   
 $= \underline{\underline{26}}$

23.  $2^4 + 2^3 + 2^2 + 2 \cdot 2^0$   
 $= 16 + 8 + 4 + 2 + 1$   
 $= \underline{\underline{31}}$

24.  $\frac{1}{8} + \frac{2}{8} + 3\frac{1}{8}$   
 $= \frac{1}{8} + \frac{2}{8} + 3\frac{1}{8}$   
 $= 3\frac{7}{8}$

25.  $-\frac{1}{4} \times \left(\frac{1}{8}\right) \times 40$   
 $= -\frac{1}{32} \times \frac{40}{1}$   
 $= \frac{-40}{32} = \frac{-5}{4}$

26.  $-\frac{1}{2} \times \left(-\frac{1}{3}\right) \times 18$   
 $= \frac{1}{6} \times \frac{18}{1}$   
 $= 3$

27.  $\frac{3}{5} \times \left(\frac{1}{2}\right) \times (-20)$   
 $= \frac{3}{10} \times \frac{(-20)}{1}$   
 $= \frac{-60}{10} = -6$

28. What is the value of  $\sqrt{\frac{8}{50}}$  expressed as a fraction in simplest form? Reduce!

$$= \sqrt{\frac{4}{25}} = \frac{\sqrt{4}}{\sqrt{25}} = \frac{2}{5}$$

29. To the nearest whole number, what is the approximate square root of 160?

$$\sqrt{144} = 12$$

$$\sqrt{169} = 13$$

160 is closest to this perfect square

30. What is 250% of 40?  $2.5(40) = 100$

$$\begin{array}{l} 100\% \text{ of } 40 = 40 \\ 200\% \text{ of } 40 = 80 \\ 50\% \text{ of } 40 = 20 \end{array} \left. \vphantom{\begin{array}{l} 100\% \\ 200\% \\ 50\% \end{array}} \right\} \underline{\underline{100}}$$

31. What is 75% of 160?

$$\begin{array}{l} 25\% \text{ of } 160 = 40 \\ 75\% \text{ of } 160 = \underline{\underline{120}} \end{array}$$

32.  $5 \times \left(3 + \frac{2}{5}\right)$

$$\begin{aligned} &= 5(3) + 5\left(\frac{2}{5}\right) \\ &= 15 + 2 \\ &= \underline{\underline{17}} \end{aligned}$$

33.  $6 \times \left(2 + \frac{1}{6}\right)$

$$\begin{aligned} &= 6(2) + 6\left(\frac{1}{6}\right) \\ &= 12 + 1 \\ &= \underline{\underline{13}} \end{aligned}$$

34.  $8 \times \left(4 + \frac{7}{8}\right)$

$$\begin{aligned} &= 8(4) + 8\left(\frac{7}{8}\right) \\ &= 32 + 7 \\ &= \underline{\underline{39}} \end{aligned}$$

What is the integer answer to the following questions:

35.  $\frac{(4^4)^4 \times 4^2}{4 \times 4^{16}}$

$$\begin{aligned} &= \frac{4^{16} \times 4^2}{4^{17}} \\ &= \frac{4^{18}}{4^{17}} = \underline{\underline{4}} \end{aligned}$$

36.  $\frac{(3^4)^5 \times 3^3}{3 \times 3^{19}}$

$$\begin{aligned} &= \frac{3^{20} \times 3^3}{3 \times 3^{19}} \\ &= \frac{3^{23}}{3^{20}} = \underline{\underline{3}} = 27 \end{aligned}$$

37.  $\frac{(2^4 \times 2)^2 \times 2^5}{2^8 \times 2^2}$

$$\begin{aligned} &= \frac{(2^5)^2 \times 2^5}{2^{10} \times 2^2} \\ &= \frac{2^{10} \times 2^5}{2^{12}} = \underline{\underline{2^5}} = 32 \end{aligned}$$

38.  $(4-5)^3$

$$\begin{aligned} &= \frac{12}{(-1)^3} = \frac{12}{-1} = \underline{\underline{-12}} \end{aligned}$$

39.  $(5-7)^2$

$$\begin{aligned} &= \frac{20}{(-2)^2} \\ &= \frac{20}{4} \\ &= \underline{\underline{5}} \end{aligned}$$

40.  $(2-5)^2$

$$\begin{aligned} &= \frac{36}{(-3)^2} \\ &= \frac{36}{9} = \underline{\underline{4}} \end{aligned}$$

41.  $\sqrt{\frac{1}{4}} \times \sqrt{\frac{16}{81}} \times \sqrt{810000}$

$$\begin{aligned} &= \frac{1}{2} \times \frac{4}{9} \times \frac{900}{1} \\ &= \frac{3600}{18} = \underline{\underline{200}} \end{aligned}$$

42.  $\sqrt{\frac{1}{25}} \times \sqrt{\frac{100}{49}} \times \sqrt{490000000}$

$$\begin{aligned} &= \frac{1}{5} \times \frac{10}{7} \times \frac{70000}{1} \\ &= \frac{700000}{35} = \underline{\underline{20000}} \end{aligned}$$