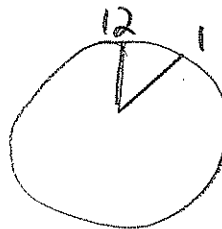


Please show all work in the space provided. The actual math portion consists of 60 questions in 60 mins.

1. What is the degree measure of the acute angle formed by the hands of a 12-hour clock that reads exactly 1 o'clock?

- A. 15°
- B. 30°
- C. 45°
- D. 60°
- E. 72°

$$\frac{360}{12} = 30^\circ$$



2. What is the probability that a number selected at random from the set  $\{2, 3, 7, \underline{12}, 15, 22, \underline{72}, \underline{108}\}$  will be divisible by both 2 and 3?

- F.  $\frac{1}{4}$
- G.  $\frac{3}{8}$
- H.  $\frac{3}{5}$
- J.  $\frac{5}{8}$
- K.  $\frac{7}{8}$

3. A circle has a circumference of  $16\pi$  feet. What is the radius of the circle, in feet?

- A.  $\sqrt{8}$
- B. 4
- C. 8
- D. 16
- E. 32

$$C = 16$$

$$r = 16/2 = 8$$

4. A rectangle with a perimeter of 30 centimeters is twice as long as it is wide. What is the area of the rectangle in square centimeters?

- F. 15
- G. 50
- H. 200
- J.  $3\sqrt{15}$
- K.  $6\sqrt{15}$

$$30 = 2w + 2(2w)$$

$$30 = 2w + 4w$$

$$30 = 6w$$

$$w = 5 \quad l = 2(5) = 10$$

$$A = 5 \times 10 = 50$$

5. In the standard  $(x,y)$  coordinate plane, what are the coordinates of the midpoint of a line segment whose endpoints are  $(-3,0)$  and  $(7,4)$ ?

- A. (2,2)
- B. (2,4)
- C. (5,2)
- D. (5,4)
- E. (5,5)

$$\left( \frac{-3+7}{2}, \frac{0+4}{2} \right) = \left( \frac{4}{2}, \frac{4}{2} \right) = (2, 2)$$

6. Which of the following statements *must* be true whenever  $n$ ,  $a$ ,  $b$ , and  $c$  are positive integers such that  $n < a$ ,  $c > a$ , and  $b > c$ ?

Smallest  $\rightarrow$  Largest  
 $n, a, c, b$

- A.  $a < n$   
B.  $b - n > a - n$   
C.  $b < n$   
D.  $n - b = a - c$   
E.  $2n > a - b$

7. What is the difference between 1.8 and  $1.\overline{08}$ ?  
 (Note: A bar indicates a digit pattern that is repeated.)

- A.  $0.\overline{71}$   
B.  $0.\overline{71}$   
C.  $0.\overline{719}$   
D.  $0.\overline{72}$   
E.  $0.\overline{72}$

$$1.8 - 1.080808 = .7191919 \dots$$

8. Which of the following equations represents the linear relationship between time,  $t$ , and velocity,  $v$ , shown in the table below?

$y = mt$

$t$	0	1	2
$v$	120	152	184

$$m = \frac{152 - 120}{1 - 0} = \frac{32}{1}$$

- ~~F.  $v = 32t$~~   
G.  $v = 32t - 120$   
~~H.  $v = 120t$~~   
~~I.  $v = 120t + 32$~~   
~~K.  $v = 120t - 120$~~

9. An industrial cleaner is manufactured using only the 3 secret ingredients A, B, and C, which are mixed in the ratio of 2:3:5, respectively, by weight. How many pounds of secret ingredient B are in a 42-pound (net weight) bucket of this cleaner?

- A. 4.2  
B. 12.6  
C. 14.0  
D. 18.0  
E. 21.0

$2+3+5=10$  parts total

$$\frac{42}{10} = 4.2$$

$$\times 3 \text{ parts B}$$

$$\underline{12.6}$$

10. If  $n = 8$  and  $16 \cdot 2^m = 4^{n-3}$ , then  $m =$ ?

- F. -4  
G. -2  
H. 0  
J. 1  
K. 8

$$16 \cdot 2^m = 1$$

$$2^m = \frac{1}{16}$$

$$2^m = \frac{1}{16} \quad m = -4$$