

MATHEMATICS TIPS (SEPTEMBER 2020)

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1. What is the sum of the 18th and 24th terms of the sequence?
- 21, - 17, - 13, - 9, ...

(A) 112 (B) 116 (C) 118 (D) 120 (E) 122

n th term = $a + (n - 1)d$, where a is the first term, and d is the common difference.

$$18^{\text{th}} \text{ term} = -21 + (18 - 1)(4) = 47$$

$$24^{\text{th}} \text{ term} = -21 + (24 - 1)(4) = 71$$

$$47 + 71 = 118$$

2. What is the circumference of a circle with an equation of
 $2(x + 4)^2 + 2(y - 7)^2 = 338$?

(A) 26π units (B) 160π units (C) $26\sqrt{2}\pi$ units
(D) $13\sqrt{2}\pi$ units (E) $2\sqrt{26}\pi$ units

Divide both sides of the given equation by 2.

$$(x + 4)^2 + (y - 7)^2 = 169$$

$(x - h)^2 + (y - k)^2 = r^2$, where (h, k) is the center of the circle and r = length of the radius.

$$r = \sqrt{169} = 13 ; \quad C = 2\pi r = 2(\pi)(13) = 26\pi$$

3. The geometric mean of the numbers 32 and 18 is how much greater than -7 ?

(A) 32 (B) 18 (C) 43 (D) 11 (E) 31

The geometric mean of 32 and 18 = $\sqrt{(32)(18)}$ = $\sqrt{(16)(2)(18)}$ = $\sqrt{(16)(36)}$ = $4(6)$ = 24.

The geometric mean, 24, is 31 greater than -7 . Answer is 31.

4. What are the roots of the equation $y = x^2 + 6x - 14$?

- (A) $-3 \pm \sqrt{23}$ (B) $3 \pm \sqrt{23}$ (C) $-3 \pm 2\sqrt{23}$
 (D) $3 \pm 2\sqrt{23}$ (E) $-6 \pm 2\sqrt{23}$

Use the quadratic formula : $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$$\frac{-6 \pm \sqrt{6^2 - 4(1)(-14)}}{2(1)} = \frac{-6 \pm \sqrt{36 + 56}}{2} = \frac{-6 \pm \sqrt{92}}{2} = \frac{-6 \pm 2\sqrt{23}}{2} = -3 \pm \sqrt{23}$$

5. The equation $|2x - 11| = 89$ has two solutions, A and B.
 If $A < B$, what is the value of $B - A$?

- (A) 11 (B) 100 (C) 50 (D) 89 (E) 78

$$2x - 11 = 89 \text{ or } 2x - 11 = -89$$

$$2x = 100 \text{ or } 2x = -78$$

$$x = 50 \text{ or } x = -39$$

Since -39 is less than 50 , then $50 - (-39) =$