SAT Math Level 2 Practice Paper 9

SET 1

1. The coordinates of the vertex of the parabola whose equation is $y = 2x^2 + 4x - 5$ are

A. (2, 11)

B. (-1, -7)

C. (1, 1)

D. (-2, -5)

E. (-4, 11)

2. The range of the function

$f = \{(x,y): y = 5 - 4x - x^2\}$ is

A. $\{y: y \leq 0\}$

B. $\{y: y \geq -9\}$

C. $\{y: y \leq 9\}$

D. $\{y: y \geq 0\}$

E. $\{y: y \leq 1\}$

3. The equation of the axis of symmetry of the function $y = 2x^2 + 3x - 6$ is

A. $x = -\frac{3}{2}$

B. $x = -\frac{3}{4}$

C. $x = -\frac{1}{3}$

D. $x = \frac{1}{3}$

E. $x = \frac{3}{4}$

4. Find the zeros of $y = 2x^2 + x - 6$.

A. 3 and 2

B. -3 and 2

C. $\frac{1}{2}$ and $\frac{3}{2}$

D. $-\frac{3}{2}$ and 1

E. $\frac{3}{2}$ and -2

5. The sum of the zeros of $y = 3x^2 - 6x - 4$ is

A. -2

B. $-\frac{4}{3}$

C. $\frac{4}{3}$

D. 2

E. 6

6. $x^2 + 2x + 3 = 0$ has

A. two real rational roots

B. two real irrational roots

C. two equal real roots

D. two equal rational roots

E. two complex conjugate roots

7. A parabola with a vertical axis has its vertex at the origin and passes through point (7,7). The parabola intersects line $y = 6$ at two points. The length of the segment joining these points is

A. 14

B. 13

C. 12

D. 8.6

E. 6.5

SET 2

1. $P(x) = ax^4 + x^3 - bx^2 - 4x + c$. If $P(x)$ increases without bound as x increases without bound, then, as x decreases without bound, $P(x)$

A. increases without bound

B. decreases without bound

C. approaches zero from above the x-axis

D. approaches zero from below the x-axis

E. cannot be determined

2. Which of the following is an odd function?

I. $f(x) = 3x^3 + 5$

II. $g(x) = 4x^6 + 2x^4 - 3x^2$

III. $h(x) = 7x^5 - 8x^3 + 12x$

A. only I

B. only II

C. only III

D. only I and II

E. only I and III

3. How many possible rational roots are there for $2x^4 + 4x^3 - 6x^2 + 15x - 12 = 0$?

A. 4

B. 6

C. 8

D. 12

E. 16

4. If both $x - 1$ and $x - 2$ are factors of $x^3 - 3x^2 + 2x - 4b$, then b must be

A. 0

B. 1

C. 2

D. 3

E. 4

5. If $3x^3 - 9x^2 + Kx - 12$ is divisible by $x - 3$, then $K =$

A. -40

B. -3

C. 3

D. 4

E. 22

6. Write the equation of lowest degree with real coefficients if two of its roots are -1 and 1 + *i*.

A. $x^3 + x^2 + 2 = 0$

B. $x^3 - x^2 - 2 = 0$

C. $x^3 - x + 2 = 0$

D. $x^3 - x^2 + 2 = 0$

E. none of the above

SET 3

1. Which of the following is equivalent to $3x^2 - x < 2$?

A. $-\frac{3}{2} < x < 1$

B. $-1 < x < \frac{2}{3}$

C. $-\frac{2}{3} < x < 1$

D. $-1 < x < \frac{3}{2}$

E. $x < -\frac{2}{3}$ or $x > 1$

2. Solve $x^5 - 3x^3 + 2x^2 - 3 > 0$.

A. $(-\infty,-0.87)$

B. (-1.90,-0.87)

C. $(-1.90,-0.87) \cup (1.58,\infty)$

D. (-0.87,1.58)

E. $(1.58,\infty)$

3. The number of integers that satisfy the inequality $x^2 + 48 < 16x$ is

A. 0

B. 4

C. 7

D. an infinite number

E. none of the above

SET 4

1. Express cos 320° as a function of an angle between 0° and 90°.

A. cos 40°

B. sin 40°

C. cos 5°

D. sin 50°

E. none of the above

2. If point *P*(-5,12) lies on the terminal side of $\angle\theta$ in standard position, sin θ =

A. $-\frac{12}{13}$

B. $\frac{-5}{12}$

C. $\frac{-5}{13}$

D. $\frac{12}{13}$

E. $\frac{12}{5}$

3. If $\sec\theta = -\frac{5}{4}$ and sin $\theta > 0$, then tan θ=

A. $\frac{4}{3}$

B. $\frac{3}{4}$

C. $-\frac{3}{4}$

D. $-\frac{4}{3}$

E. none of the above

4. If *x* is an angle in quadrant III and tan (*x* - 30°) = cot *x*, find *x*.

A. 240°

B. 225°

C. 210°

D. 60°

E. none of the above

5. If 90° < α < 180° and 270° < β < 360°, then which of the following *cannot* be true?

A. sin α = sin β

B. tan α = sin β

C. tan α = tan β

D. sin α = cos β

E. sec α = csc β

6. Expressed as a function of an acute angle, cos 310° + cos 190° =

A. -cos 40°

B. cos 70°

C. -cos 50°

D. sin 20°

E. -cos 70°

SET 5

1. An angle of 30 radians is equal to how many degrees?

A. $\frac{\pi}{30}$

B. $\frac{\pi}{6}$

C. $\frac{30}{\pi}$

D. $\frac{540}{\pi}$

E. $\frac{5400}{\pi}$

2. If a sector of a circle has an arc length of 2π inches and an area of 6π square inches, what is the length of the radius of the circle?

A. 1

B. 2

C. 3

D. 6

E. 12

3. If a circle has a circumference of 16 inches, the area of a sector with a central angle of 4.7 radians is

A. 10

B. 12

C. 15

D. 25

E. 48

4. A central angle of 40° in a circle of radius 1 inch intercepts an arc whose length is *s*. Find *s*.

A. 0.7

B. 1.4

C. 2

D. 3

E. 40

5. The pendulum on a clock swings through an angle of 25°, and the tip sweeps out an arc of 12 inches. How long is the pendulum?

A. 1.67 inches

B. 13.8 inches

C. 27.5 inches

D. 43.2 inches

E. 86.4 inches