



Regents Practice Test 3

Algebra 2 Trigonometry

Part I: Multiple Choice

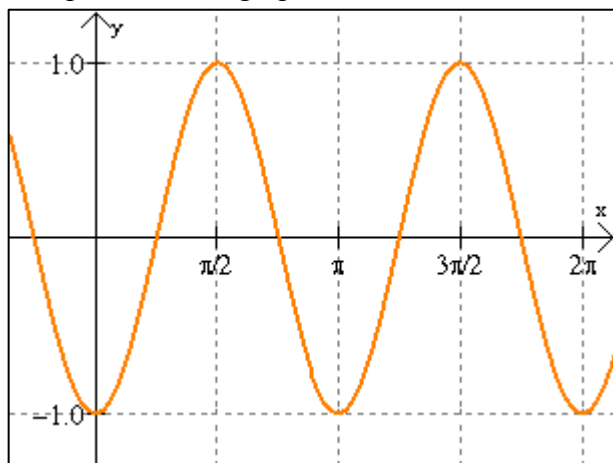
1. Rationalize the denominator and simplify: $\frac{4 + \sqrt{3}}{2 - \sqrt{3}}$
- [1] $11 + 6\sqrt{3}$ [2] $5 - 2\sqrt{3}$ [3] 11 [4] $\frac{11 + 6\sqrt{3}}{-5}$
2. The expression $\frac{x^5 y^{-4} z^2}{x^{-3} y^3 z}$ is equivalent to
- [1] $\frac{y^7 z}{x^8}$ [2] $\frac{x^8 z}{y^7}$ [3] $\frac{x^2 z}{y}$ [4] $x^2 y^{-1} z$
3. The roots of the equation $x^2 - 7x + 3 = 0$ are
- [1] $\frac{-7 \pm \sqrt{61}}{2}$ [2] $\frac{-7 \pm \sqrt{37}}{2}$ [3] $\frac{7 \pm i\sqrt{61}}{2}$ [4] $\frac{7 \pm \sqrt{37}}{2}$
4. Find, to the *nearest tenth*, the standard deviation of this distribution:
- | Score | 1 | 2 | 3 | 4 | 5 |
|-----------|----|----|----|----|----|
| Frequency | 14 | 15 | 14 | 17 | 10 |
- [1] 1.3 [2] 1.4 [3] 2.8 [4] 2.9
5. A circle has a radius of 3.5 cm. In centimeters, what is the length of an arc intercepted by a central angle of 4 radians?
- [1] 14 cm [2] 12 cm [3] 8 cm [4] 1.1 cm

6. Which of the following is NOT equivalent to ${}_6C_5$?
- [1] $\frac{6!}{5!(6-5)!}$ [2] $\frac{{}_6P_5}{5!}$ [3] $\binom{5}{6}$ [4] ${}_6C_1$
7. Expressed in interval notation, the solution set of $\left| \frac{a}{2} + 6 \right| + 3 \leq 13$ is
- [1] [-8, 8] [2] (-8, 8) [3] [-32, 8] [4] (-32, 8)
8. The expression $(10 - \sqrt{-72}) + (8 + \sqrt{-8})$ is equivalent to
- [1] $18 - 4\sqrt{2}$ [2] $18 + 4\sqrt{2}$ [3] $18 + 4i\sqrt{2}$ [4] $18 - 4i\sqrt{2}$
9. What are the values of θ in the interval $0^\circ \leq \theta < 360^\circ$ that satisfy the equation $\sin \theta - \frac{1}{2} = 0$?
- [1] $30^\circ, 150^\circ$ [2] $60^\circ, 120^\circ$ [3] $60^\circ, 120^\circ, 240^\circ, 300^\circ$ [4] $30^\circ, 150^\circ, 210^\circ, 330^\circ$
10. A fair coin is tossed 5 times. What is the probability that the coin will land tails up exactly 3 times?
- [1] $\left(\frac{1}{2}\right)^3$ [2] $\frac{3}{5}$ [3] $10\left(\frac{1}{2}\right)^5$ [4] $10\left(\frac{1}{2}\right)^3$
11. A bag of cookies contains 6 oatmeal cookies, 5 pecan cookies, and 1 peanut butter cookie. Alisha selects 2 cookies at random. What is the probability that she selected 2 oatmeal cookies?
- [1] $\frac{5}{22}$ [2] $\frac{5}{11}$ [3] $\frac{6}{11}$ [4] $\frac{1}{6}$

- 12.** Which equation represents the equation of a circle that is tangent to the x-axis with a center located at (4, -6)?
 [1] $(x + 4)^2 + (y - 6)^2 = 36$ [3] $(x + 4)^2 + (y - 6)^2 = 6$
 [2] $(x - 4)^2 + (y + 6)^2 = 36$ [4] $(x - 4)^2 + (y + 6)^2 = 6$
- 13.** In $\triangle ABC$, $AB = 12$ meters and $AC = 20$ meters. If the area of the triangle is 77 square meters, find the measure of angle A to the nearest degree.
 [1] 64° [2] 50° [3] 40° [4] 39°
- 14.** The expression $\sin 5x \cos 2x - \cos 5x \sin 2x$ is equivalent to
 [1] $\cos 7x$ [2] $\cos 3x$ [3] $\sin 7x$ [4] $\sin 3x$
- 15.** What is the domain of the function $f(x) = \frac{5}{2x^2 - x - 3}$?
 [1] $x = 1$ and $x = -3/2$
 [2] $x = -1$ and $x = 3/2$
 [3] All real numbers, except 1 and $-3/2$
 [4] All real numbers, except -1 and $3/2$
- 16.** Factored completely, the expression $-18x^2 - 8x^3 - 4x$ is equivalent to
 [1] $2x(4x - 2)(x - 1)$ [3] $-2x(4x + 2)(x + 1)$
 [2] $-2x(4x + 1)(x + 2)$ [4] $2x(4x - 1)(x - 2)$
- 17.** The equation $\frac{x-3}{x+5} \div \frac{x-3}{x+5} = 1$ is true for all rational values of x , such that x does NOT equal
 [1] -5 [2] 3 [3] -5 or 3 [4] $-5, 3$, or 1

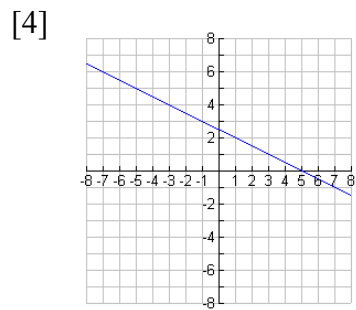
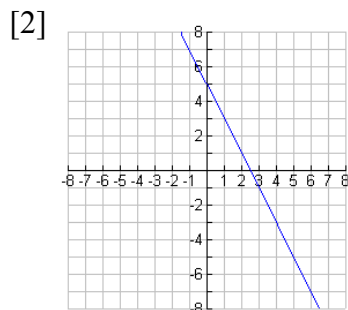
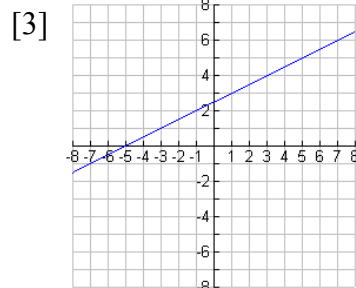
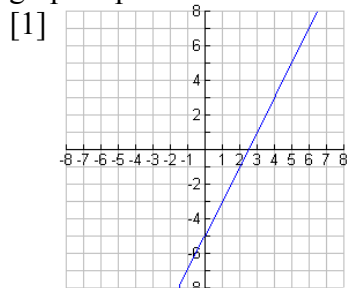
- 18.** The expression $\ln [(x + 5)(2x - 1)^2]$ is equivalent to
 [1] $2 [\ln (x + 5) + \ln (2x - 1)]$ [3] $2 \ln (x + 5) + 2 \ln (x - 1)$
 [2] $\ln (x + 5) + 2 \ln (2x - 1)$ [4] $\ln (x + 5) \cdot 2 \ln (2x - 1)$
- 19.** Find the exact value of $\sin 30^\circ + \cos 30^\circ + \tan 30^\circ$.
 [1] $\frac{1}{4}$ [2] $\frac{2 + \sqrt{3}}{4}$ [3] $\frac{3 + 5\sqrt{3}}{6}$ [4] $\frac{2 + \sqrt{2}}{4}$
- 20.** In the equation $\left(\frac{1}{3}\right)^x = 2$ the value of x rounded to the nearest thousandth is
 [1] 0.834 [2] -0.834 [3] 0.631 [4] -0.631
- 21.** In terms of transformations, which description describes how the graph of $g(x) = (x + 2)^2$ was produced from the graph of $f(x) = x^2$?
 [1] Function f was translated (shifted) horizontally two units to the left.
 [2] Function f was translated (shifted) horizontally two units to the right.
 [3] Function f was translated (shifted) vertically two units up.
 [4] Function f was translated (shifted) vertically two units down.

22. The period of the graph shown below is



- [1] π [2] $\pi/2$ [3] 2π [4] $3\pi/2$

23. If a function is defined by the equation $f(x) = 2x - 5$, which graph represents the inverse of this function?



24. What is the 12th term in the sequence $a_n = (-1)^{n+1} e^{n^2}$?
 [1] $-e^{144}$ [2] e^{144} [3] -144 [4] 144

25. Which notation represents the series $-3 + 6 - 12 + 24 - 48 + \dots$ for 35 terms?

[1] $\sum_{n=1}^{35} (-1)^n \cdot 3n$

[3] $\sum_{n=1}^{35} (-1)^n \cdot 3 \cdot 2^{n-1}$

[2] $\sum_{n=1}^{35} (-1)^{n+1} \cdot 3n$

[4] $\sum_{n=1}^{35} (-1)^{n+1} \cdot 3 \cdot 2^{n-1}$

26. Which function is the inverse function of $y = \ln x$?

[1] $y = e^x$
 [2] $y = e^{-x}$

[3] $y = \ln x^{-1}$
 [4] $y = \log x$

27. Which of the following is *ALWAYS* true?

[1] $f(g(x)) = g(f(x))$ [3] $f(g(x)) = f(x) \cdot g(x)$

[2] $f(f(x)) = (f(x))^2$ [4] $f(g(x)) = (f \circ g)(x)$