

Circles, Parabolas & Hyperbolas

ACMNA267 – Linear and non-Linear Relationships



Name: _____



Assessment



TI-Navigator



Student



30 min

Score: _____

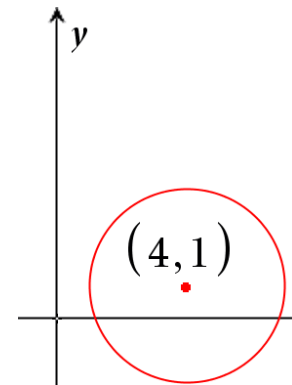
Teacher: _____

Q.1. A circle with centre (0, 0) and radius 5 units has point (x, 4) on its circumference. The value of x could be

- a) ± 3 b) 5 c) ± 4 d) 2 e) $0 < x < 5$

Q.2. The circle $x^2 + y^2 = 3^2$ is translated as shown. The equation of the translated circle is

- a) $x^2 + 4 + y^2 + 1 = 9$ b) $(x - 4)^2 + (y + 1)^2 = 3^2$
c) $(x + 4)^2 + (y - 1)^2 = 3^2$ d) $(x - 4)^2 + (y - 1)^2 = 3^2$
e) $(x + 4)^2 + (y + 1)^2 = 3^2$



Q.3. A parabola has equation: $y = 2(x - 3)(x + 1)$. It has roots (cuts the x-axis) at $x =$

- a) 0 and 6 b) 2 and -6 c) 3 and -1 d) 1 and 3 e) 6 and -2

Q.4. A parabola has the equation: $y = 2x^2 - 3x + 1$. It has a y-intercept and axis of symmetry at:

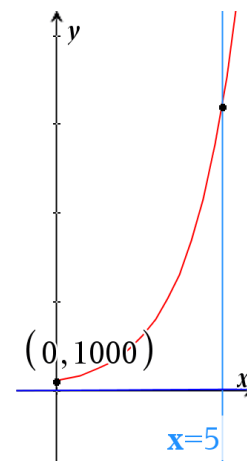
- a) $\left(0, \frac{1}{2}\right)$ b) $\left(0, \frac{1}{2}\right)$ c) (0,1) d) (0,1) e) (0,1)
 $x = -\frac{3}{2}$ $x = \frac{3}{2}$ $x = \frac{1}{3}$ $x = -\frac{3}{4}$ $x = \frac{3}{4}$

Q.5. The exponential function $y = 2^x + 3$ has a y-intercept and an asymptote:

- a) (0,3) b) (0,3) c) (0,4) d) (0,4) e) (0,4)
 $x = 2$ $y = 3$ $x = 3$ $y = 3$ $y = 0$

Q.6. Bacterial cells reproduce by dividing in half. A culture initially contains 1000 bacteria. After 5 generations there will be:

- a) $1000 + 2^5$ bacteria b) $1000 \times \left(\frac{1}{2}\right)^5$ bacteria
 c) $1000 \times \frac{1}{2} \times 5$ bacteria d) 5000 bacteria
 e) 1000×2^5 bacteria



Q.7. A rectangular hyperbola has rule: $xy = 1$ and a square hyperbola has rule: $x^2y = 1$. Which of the following is **not true** of their graphs?

- a) They both pass through (1, 1) b) They both have the same asymptotes
 c) They both pass through (-1, 1) d) Neither pass through the origin
 e) The maximum possible y value is ∞

Q.8. The quadratic $y = -x^2 + 10x + 25$ has:

- a) 2 roots (x intercepts) since $\Delta > 0$ b) 2 roots (x intercepts) since $\Delta = 0$
 c) 1 root (x intercepts) since $\Delta = 0$ d) No roots (x intercepts) because the graph is below the x axis.
 e) No roots (x intercepts) since $\Delta < 0$

Q.9. The graph $y = 2x^2$ is translated -3 units parallel to the x axis and -1 unit parallel to the y axis. The transformed graph would have equation:

- a) $y = 2(x-3)^2 - 1$ b) $y = 2(x+3)^2 - 1$
 c) $y = (2x-3)^2 - 1$ d) $y = 2(x+3)^2 + 1$
 e) $y = 2(x-3)^2 + 1$

Q.10. Boyle's law states "if you increase the volume of a gas the pressure drops" according to the equation: $P = \frac{k}{V}$. If $k = 20$, which of the following is true?

- a) V can equal zero. b) The graph would be a parabola.
 c) V must be greater than 20. d) V can be any value.
 e) The graph has two asymptotes.