Circles, Parabolas & Hyperbolas

ACMNA267 – Linear and non-Linear Relationships

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Name:

Score:

Teacher:
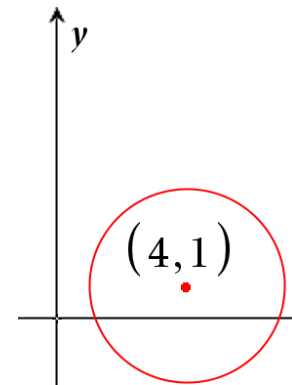
Assessment   TI-Navigator   Student   30 min

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) $(x+4)^2 + (y+1)^2 = 3^2$

$(4,1)$

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

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

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

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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) $1000 \times \left(\dfrac{1}{2}\right)^5$ bacteria

c) $1000 \times \dfrac{1}{2} \times 5$ bacteria

d)   5000 bacteria

e) 1000×2^5 bacteria

$(0, 1000)$

x=5
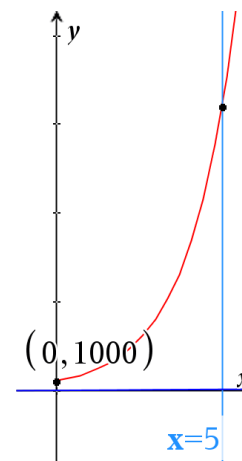
Q.7.   A rectangular hyperbola has rule: $xy = 1$ and a square hyperbola has rule: $x^2 y = 1$. Which of the following is **not true** of their graphs?

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 sates "if you increase the volume of a gas the pressure drops" according to the equation: $P = \dfrac{k}{V}$. 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.

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