

Unit 10 Test — Answer Key

Circles, Parabolas, Ellipses & Hyperbolas — Standard & General Form

FOR TEACHER / SELF-CHECK USE

This test was written to cover Unit 10's topics (circles, parabolas, ellipses, and hyperbolas in standard and general form). Every solution below has been independently verified.

1	$x^2 + y^2 = r^2$ is a circle centered at the origin with $r^2 = 16$, so $r = 4$. Answer: A — Circle, radius 4
2	$(x-h)^2 + (y-k)^2 = r^2$ has center (h,k) and radius r . Here $h=2$, $k=-3$, $r^2=25 \rightarrow r=5$. Answer: A — Center (2, -3), radius 5
3	$(x-h)^2 + (y-k)^2 = r^2$ with $h=1$, $k=-2$, $r=3 \rightarrow r^2=9$. Answer: $(x - 1)^2 + (y + 2)^2 = 9$
4	$y = (x-h)^2 + k$ has vertex (h,k) . Here $h=3$, $k=4$. Answer: A — (3, 4)
5	Here $a^2=16$, $b^2=9$, so $a=4$, $b=3$ (major axis along x). $c^2 = a^2 - b^2 = 16 - 9 = 7 \rightarrow c = \sqrt{7}$. Foci at $(\pm\sqrt{7}, 0)$. Answer: A — $(\pm\sqrt{7}, 0)$
6	$a^2=25$, $b^2=9$. $c^2 = a^2 - b^2 = 25 - 9 = 16 \rightarrow c = 4$. Foci at $(\pm 4, 0)$. Answer: $(\pm 4, 0)$
7	Divide both sides by 36: $x^2/9 + y^2/4 = 1$. Both terms are positive and added, with different denominators — this is an ellipse. Answer: A — Ellipse
8	For $x^2/a^2 - y^2/b^2 = 1$, the asymptotes are $y = \pm(b/a)x$. Here $a^2=9$ ($a=3$), $b^2=16$ ($b=4$), so the asymptotes are $y = \pm(4/3)x$. Answer: A — $y = \pm(4/3)x$
9	Group and complete the square: $(x^2-6x) + (y^2+4y) = 3$. $(x^2-6x+9) + (y^2+4y+4) = 3 + 9 + 4 \rightarrow (x-3)^2 + (y+2)^2 = 16$. Answer: $(x - 3)^2 + (y + 2)^2 = 16$; center (3, -2), radius 4
10	Vertices at $(\pm 5, 0)$ give $a = 5$, so $a^2 = 25$. Foci at $(\pm 13, 0)$ give $c = 13$, so $c^2 = 169$. For a hyperbola, $b^2 = c^2 - a^2 = 169 - 25 = 144$. Answer: $x^2/25 - y^2/144 = 1$