

Math 114
Absolute Value, Radicals, Rational Exponents & Functions (Intro) Review

[1] [a] If $f(x) = x^2 + 3x - 5$, find $f(-2)$.

[b] If $f(x) = \frac{2x}{x^2 + 1}$, find $f(3)$.

[c] If $f(x) = 5 - 2\sqrt{4 - x}$, find $f(-5)$.

[2] [a] If $f(x) = 2 - 3x - x^2$, find $f(a - 1)$.

[b] If $f(x) = 2x^2 + 5x + 1$, find $f(a + 3)$.

[3] Which of the following are functions ?

[a]

x	2	5	8	9
$f(x)$	3	-2	-2	1

[b]

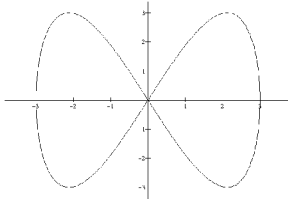
x	6	4	7	4
$f(x)$	3	-2	4	1

[c]

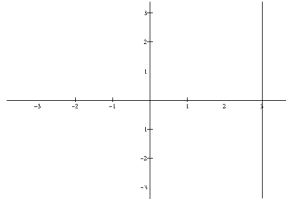
x	-1	3	0	10
$f(x)$	-1	3	0	10

[4] Which of the following graphs represent functions ?

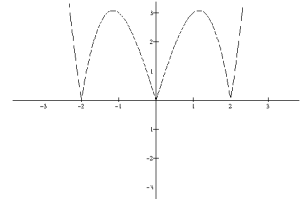
[a]



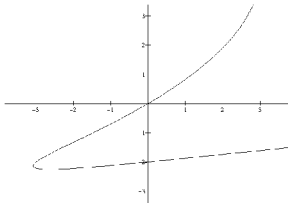
[b]



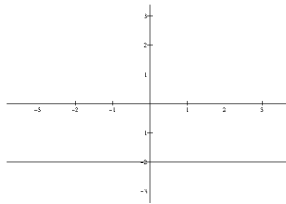
[c]



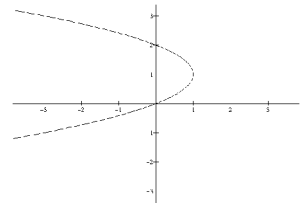
[d]



[e]



[f]



[5] Write using fractional and/or negative exponents wherever possible, and simplify.

[a] $\sqrt[5]{j^8}$

[b] $(\sqrt[4]{e})^{11}$

[c] $\sqrt{w^5}$

[d] $(\sqrt{f})^9$

[e] $\sqrt[3]{z}$

[f] $\left(\frac{1}{\sqrt{u}}\right)^5$

[6] Simplify. You may write your answers using either radicals or fractional exponents.

[a] $\sqrt{98}$

[b] $\sqrt{108}$

[c] $\sqrt{q^{14}}$

[d] $\sqrt[6]{h^{24}}$

[e] $\left(c^{\frac{2}{3}}\right)^{\frac{6}{5}}$

[f] $t^{\frac{2}{5}}t^{\frac{1}{3}}$

[g] $\frac{a^{\frac{2}{3}}}{a^{\frac{1}{5}}}$

[h] $(49y^{-6})^{\frac{1}{2}}$

[i] **DELETED**

[j] **DELETED**

[k] $5\sqrt{7} + 8\sqrt{7}$

[l] $2\sqrt{6} - 7\sqrt{6}$

[m] $\sqrt{108} - \sqrt{48}$

[n] $\sqrt{50x^7} - 3x\sqrt{8x^5}$

[o] $\sqrt{30}\sqrt{18}$

[p] $m^6m^{\frac{2}{3}}$

[q] $r^{\frac{3}{4}}r$

[r] $\sqrt{3}(4\sqrt{3} - \sqrt{6})$

[s] $(\sqrt{2} + 2\sqrt{3})(4\sqrt{3} - \sqrt{6})$

[7] Rationalize the denominator, and simplify.

[a] $\frac{1}{3\sqrt{5}}$

[b] $\frac{4}{7\sqrt{6}}$

[c] $\frac{6}{\sqrt{7}+3}$

[8] Divide. Rationalize the denominator and simplify, if possible.

[a] $\frac{\sqrt{72}}{\sqrt{9}}$

[b] $\frac{\sqrt{5}}{\sqrt{60}}$

[9] Divide. Write your answer using fractional exponents.

[a] $\frac{s^2}{\sqrt[4]{s}}$

[b] $\frac{\sqrt[3]{v}}{\sqrt[5]{v}}$

[10] Solve. Check your answers for full credit.

[a] $\sqrt[3]{j} = 3$

[b] $\sqrt[5]{6u-9} = \sqrt[5]{5-u}$

[c] $\sqrt{4f-7} = 11$

[d] $4 + 3\sqrt{w} = 13$

[e] $17 - 2\sqrt{1-3z} = 9$

[f] $q + \sqrt{q+11} = 1$

[11] Simplify. Write your answers using radicals.

[a] $\sqrt{72h^7}$

[b] $\sqrt{20c^8t^{11}y^6}$

[c] $\sqrt{20a^7}\sqrt{15a^8}$

[d] $(5 - \sqrt{3y})(5 + \sqrt{3y})$

[e] $\frac{\sqrt{3}}{\sqrt{64d^6j}}$

[12] Find the distance between the points $(-2, 7)$ and $(-5, -2)$.

[13] Find the equation of the circle with center $(-2, 5)$ and radius 9.

[14] Find the centers and radii of the following circles.

[a] $(x-7)^2 + (y+4)^2 = 25$

[b] $x^2 + y^2 + 4x + 10y + 12 = 0$

[15] Solve $3 + |2x + 1| = 10$

[16] Solve $|3x - 2| < 8$

[17] Solve $|5 - 4x| > 11$

ANSWERS

[1]	[a]	-7	[b]	$\frac{3}{5}$	[c]	-1				
[2]	[a]	$4 - a - a^2$	[b]	$2a^2 + 17a + 34$						
[3]	[a]	yes	[b]	no	[c]	yes				
[4]	[a]	no	[b]	no	[c]	yes	[d]	no	[e]	yes
	[f]	no								
[5]	[a]	$j^{\frac{8}{5}}$	[b]	$e^{\frac{11}{4}}$	[c]	$w^{\frac{5}{2}}$	[d]	$f^{\frac{9}{2}}$	[e]	$z^{\frac{1}{7}}$
	[f]	$u^{-\frac{5}{2}}$								
[6]	[a]	$7\sqrt{2}$	[b]	$6\sqrt{3}$	[c]	q^7	[d]	h^4	[e]	$c^{\frac{4}{5}}$
	[f]	$t^{\frac{11}{15}}$	[g]	$a^{\frac{7}{15}}$	[h]	$7y^{-3}$	[i]	DELETED	[j]	DELETED
	[k]	$13\sqrt{7}$	[l]	$-5\sqrt{6}$	[m]	$2\sqrt{3}$	[n]	$-x^3\sqrt{2x}$	[o]	$6\sqrt{15}$
	[p]	$m^{\frac{20}{3}}$	[q]	$r^{\frac{7}{4}}$	[r]	$12 - 3\sqrt{2}$	[s]	$24 - 6\sqrt{2} - 2\sqrt{3} + 4\sqrt{6}$		
[7]	[a]	$\frac{\sqrt{5}}{15}$	[b]	$\frac{2\sqrt{6}}{21}$	[c]	$9 - 3\sqrt{7}$				
[8]	[a]	$2\sqrt{2}$	[b]	$\frac{\sqrt{3}}{6}$						
[9]	[a]	$s^{\frac{7}{4}}$	[b]	$v^{\frac{2}{15}}$						
[10]	[a]	$j = 27$	[b]	$u = 2$	[c]	$f = 32$	[d]	$w = 9$	[e]	$z = -5$
	[f]	$q = -2$								
[11]	[a]	$6h^3\sqrt{2h}$	[b]	$2c^4t^5y^3\sqrt{5t}$	[c]	$10a^7\sqrt{3a}$	[d]	$25 - 3y$	[e]	$\frac{\sqrt{3j}}{8d^3j}$
[12]		$3\sqrt{10}$								
[13]		$(x + 2)^2 + (y - 5)^2 = 81$								
[14]	[a]	center = $(7, -4)$, radius = 5								
	[b]	center = $(-2, -5)$, radius = $\sqrt{17}$								
[15]		$x = 3$ or $x = -4$								
[16]		$-2 < x < \frac{10}{3}$								
[17]		$x < -\frac{3}{2}$ or $x > 4$								