

[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]

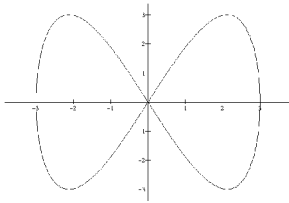
x	6	4	7	4
$f(x)$	3	-2	4	1

[c]

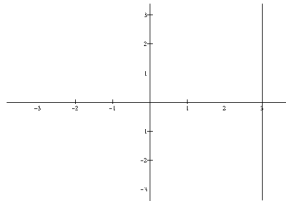
x	-1	3	0	10
$f(x)$	-1	3	0	10

[4] Which of the following graphs represent functions ?

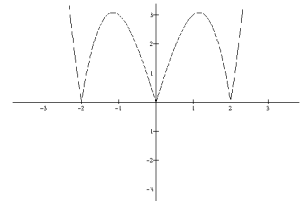
[a]



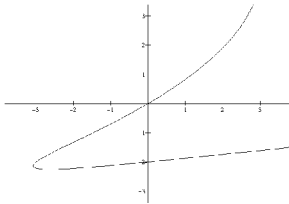
[b]



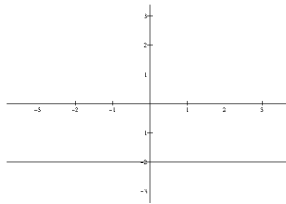
[c]



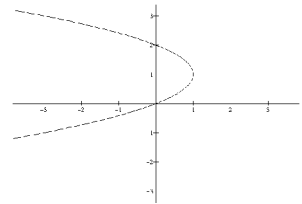
[d]



[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. Write your answers using radicals, except problems marked (*) (use fractional exponents for only those problems).

[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](*) $m^6m^{\frac{2}{3}}$

[j](*) $r^{\frac{3}{4}}r$

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

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

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

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

[g] $8 - 5\sqrt{v} = 33$

[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 $|5 - 4x| > 11$

[18] Translate into absolute value equations or inequalities.

[a] x is no more than 8 away from 5

[b] x and -2 are 5 units apart

[c] x is a minimum of 12 away from 1

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] $m^{\frac{20}{3}}$ [j] $r^{\frac{7}{4}}$
- [k] $13\sqrt{7}$ [l] $-5\sqrt{6}$ [m] $2\sqrt{3}$ [n] $-\sqrt{2}x^{\frac{7}{2}}$ [o] $12 - 3\sqrt{2}$
- [p] $6\sqrt{15}$ [q] $24 - 6\sqrt{2} - 2\sqrt{3} + 4\sqrt{6}$
- [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] $q = -2$ [g] no solution
- [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 $x > 4$
- [18] [a] $|x - 5| \leq 8$ [b] $|x + 2| = 5$ [c] $|x - 1| \geq 12$