ABSOLUTE VALUE FUNCTIONS

12 Solve for x:

(a) $|x-2|=3$ (b) $|x+3|=7$ (c) $|4-x|=5$ (d) $|x+7|=2$

(m) $|3x+1|=0$ (n) $|6x+1|=7$ (o) $|4x-1|=0$ (p) $|2x-9|=13$

14 Solve:

(a) $|x-1|<3$ (b) $|y+2|>4$ (c) $|t-6|\leq 2$ (d) $|x+4|\geq 2$

27 $|x-1|<-2$ **28** $|2x-3|\leq 5$ **29** $|3x+2|<2$ **30** $|x^2-1|\leq 4$

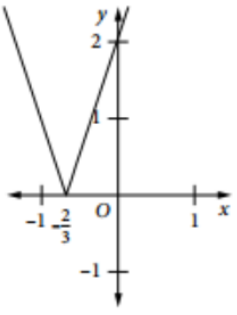
ABSOLUTE VALUE FUNCTIONS

40 For the following values of x and y, verify that **(i)** $|xy| = |x| \times |y|$ and **(ii)** $|x + y| \leq |x| + |y|$.

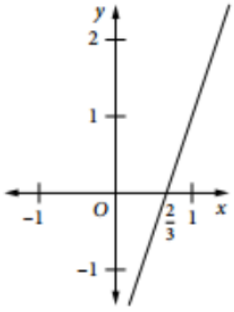
(a) $x = 5, y = 2$ **(b)** $x = 3, y = -2$ **(c)** $x = -6, y = 8$ **(d)** $x = -4, y = -3$

2 Which diagram is the correct sketch of $y = |3x - 2|$?

A



B



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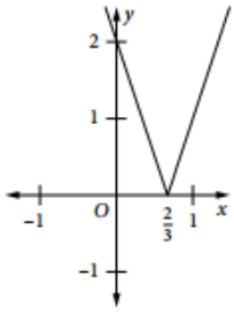
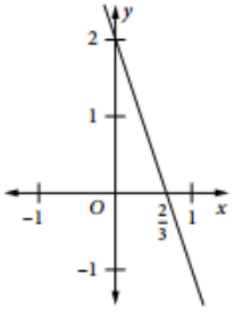


D

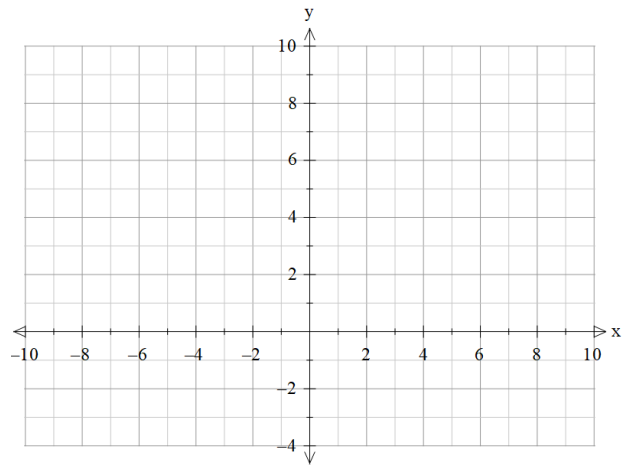


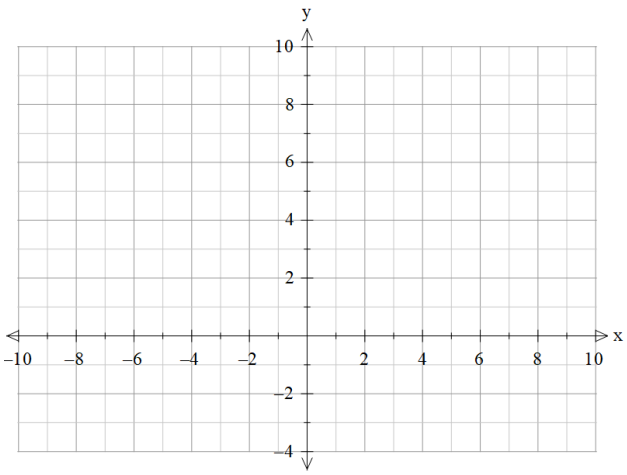
ABSOLUTE VALUE FUNCTIONS

1 Sketch the graphs of the following absolute value functions defined for all x and state the range in each case.

(a) $f(x) = |x - 4|$

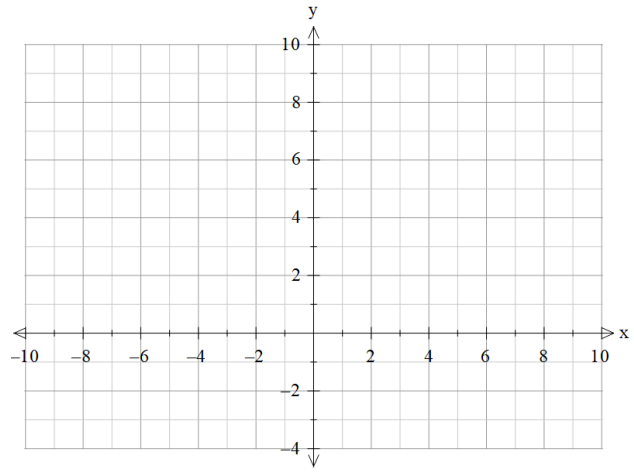
(b) $g(x) = |x| - 2$

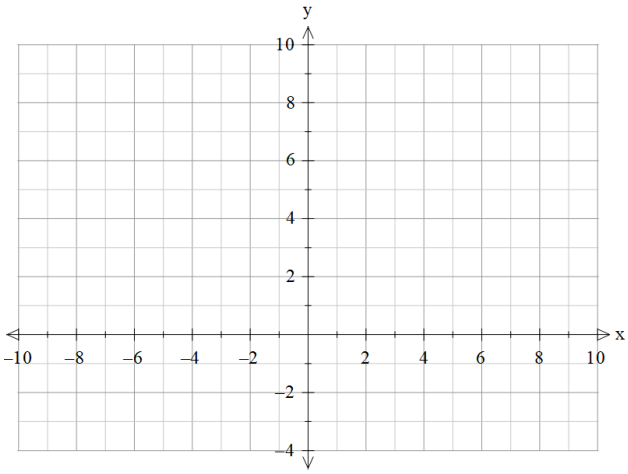




(e) $h(x) = |3x - 6|$

(h) $f(x) = 2x + |x|$





3 State the largest possible domain for:

(a) $f(x) = \sqrt{x-2} + \sqrt{3-x}$

(b) $f(x) = \dfrac{x}{|x|}$

4 State whether the following functions are odd, even or neither, defined on their largest possible domain.

(a) $f(x)=x$ **(b)** $f(x)=x+1$ **(c)** $f(x)=|x|$

(g) $f(x)=\sqrt{4-x^2}$ **(h)** $f(x)=\dfrac{x}{x^2-1}$ **(i)** $f(x)=x^2+x$

5 Find the largest possible range for the following functions:

(a) $f(x)=(x-3)^2$ **(b)** $f(x)=x+|x|$ **(c)** $f(x)=\sqrt{16-x^2}$ **(d)** $f(x)=16-x^2$

9 For the given graph, state whether each statement is correct or incorrect.

(a) The domain is real x, $x\neq 0$.
(b) The range is real y, $-1<y<1$.
(c) The gradient of the function is zero.
(d) The equation of the function could be $y=\dfrac{|x|}{x}$.