



Academic Learning Center

Math Handout

Domain Practice Problems - Mixed

Find the Domain of the following functions:

$$1. f(x) = \frac{3x}{2+x}$$

$$\begin{array}{r} 2 + x = 0 \\ -2 \quad -2 \\ \hline x = -2 \end{array}$$

Domain: All real numbers
except $x = -2$.

$$2. f(x) = 3x^2 - 2x + 13$$

Domain: All real numbers.

$$3. f(x) = \sqrt{7+x}$$

$$\begin{array}{r} 7 + x \geq 0 \\ -7 \quad -7 \\ \hline x \geq -7 \end{array}$$

Domain: $x \geq -7$

$$4. f(x) = \sqrt{3x^2 + 7x - 4}$$

Domain: All real numbers.

$$5. f(x) = 3x^2 + \sqrt{7x} - 4$$

$$\frac{7x}{7} \geq \frac{0}{7}$$
$$x \geq 0$$

Domain: $x \geq 0$

$$6. f(x) = \frac{2}{3}x + 4$$

Domain: All real numbers.

$$7. f(x) = \frac{2}{3x} + 4$$

$$\frac{3x}{3} = \frac{0}{3}$$
$$x = 0$$

Domain: All Real Numbers
Except $x = 0$.

$$8. f(x) = \sqrt{6 - 3x}$$

$$6 - 3x \geq 0$$
$$\frac{-6}{-3} \geq \frac{-6}{-3}$$
$$x \leq 2$$

Divide by a negative #
flip inequality sign

Domain: $x \leq 2$

$$9. f(x) = \frac{3x+9}{x^2-x-42}$$

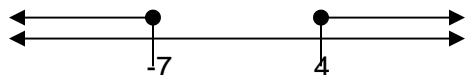
$$\begin{aligned} x^2 - x - 42 &= 0 \\ (x-7)(x+6) &= 0 \\ x-7=0 \quad x+6=0 \\ x=7 \quad x=-6 \end{aligned}$$

Domain: All real numbers
except $x = 7$ and $x = -6$.

$$10. f(x) = \sqrt{x^2 + 3x - 28}$$

$$\begin{aligned} x^2 + 3x - 28 &\geq 0 \\ (x+7)(x-4) &\geq 0 \\ x+7=0 \quad x-4=0 \\ x=-7 \quad x=4 \end{aligned}$$

$(x+7)$	-	+	+
$(x-4)$	-	-	+
	= +	= -	= +
Test Points:	(-8)	(0)	(5)



Domain: $x \leq -7$ and $x \geq 4$

$$11. f(x) = \frac{3x+11}{4}$$

Domain: All real numbers.

$$12. f(x) = 5$$

Domain: All real numbers.

$$13. f(x) = \sqrt{10}$$

Domain: All real numbers.

$$14. f(x) = \sqrt{2}x^2 - \frac{3}{5}x + 7^{-2}$$

Domain: All real numbers.

$$15. f(x) = \frac{5}{\sqrt{x+3}}$$

$$x + 3 > 0$$

$$\frac{-3}{x} > -3$$

Notice that > 0 was used instead of ≥ 0

Since the square root is in the denominator of the fraction it cannot equal zero.

Domain: $x > -3$