Quotients of Functions

Jan 8/2019

$$(f \div g)(x) = f(x) \div g(x)$$

Ex.1 Given $f = \{(1,5),(2,0),(4,-5),(5,11)\}$

$$g = \{(2,-4),(3,1),(5,0)\}$$

(a) determine the domain of *f*, *g*, and $(f \div g)$

(b) determine $(f \div g)$

(a) $D_f = \{1,2,4,5\}$ $D_g = \{2,3,5\}$

$D_{f \div g} = \{2,5\}$ ×

(b) $f \div g = \{(2, \frac{0}{-4}), (5, \frac{11}{0})\}$ ×

0 ✓ undefined, ∄

$f \div g = \{(2,0)\}$

$D_{f \div g} = \{2\}$

Jan 7-8:29 AM

Note: Since g(x) is in the denominator, and we must avoid division by zero, the domain has an additional condition:

$$D_{f \div g} = D_f \cap D_g, g(x) \neq 0$$

Ex.2 Given $f(x) = x^2 + x - 6$

$g(x) = \sqrt{x+3}$

determine $(g \div f)(x)$ and state the domain.

$(g \div f)$

$g \div f = \frac{\sqrt{x+3}}{(x+3)(x-2)}$

$D_f = \{x \in \mathbb{R}\}$ $D_g = \{x \in \mathbb{R} \mid x \geq -3\}$

also, $f(x) \neq 0$ (denominator)

$x \neq -3, 2$

$D_{g \div f} = \{x \in \mathbb{R} \mid -3 \leq x < 2, x > 2\}$

OR

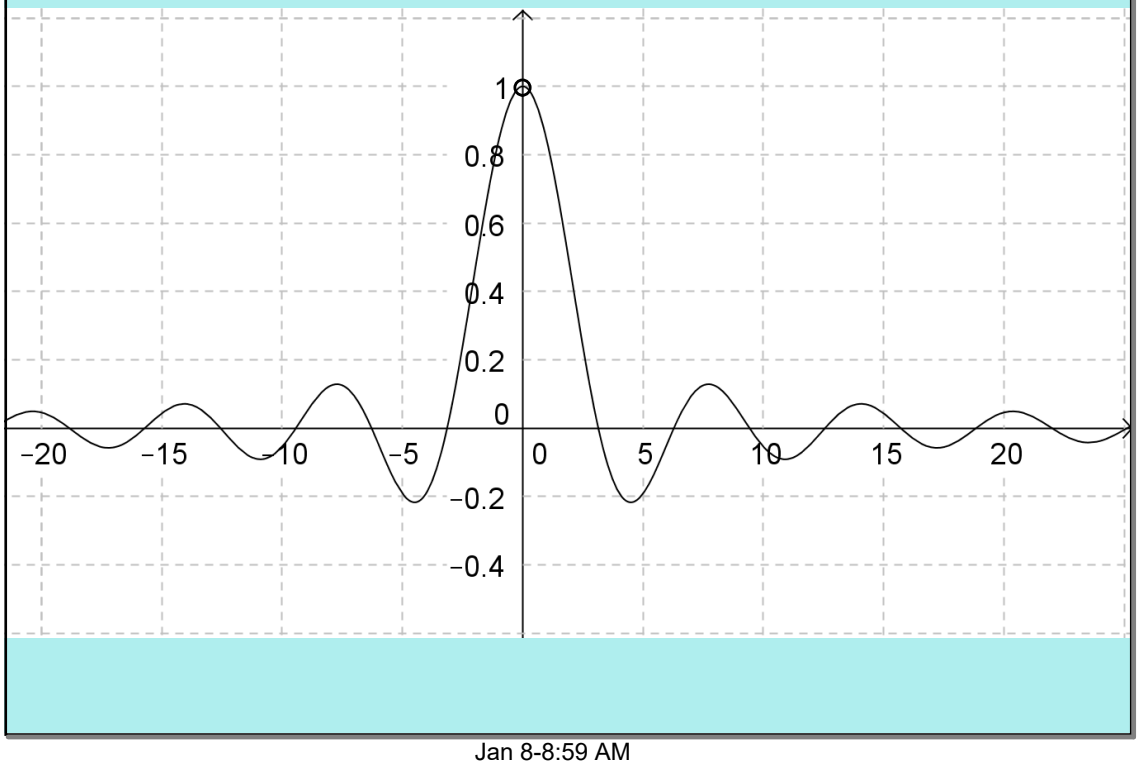
$D_{g \div f} : (-3,2) \cup (2,\infty)$

$g \div f = \frac{(x+3)^{\frac{1}{2}}}{(x+3)(x-2)}$

$= \frac{1}{\sqrt{x+3}\,(x-2)}$

Jan 6-8:57 AM

Example: $\dfrac{\sin x}{x}$ $D = \{x \in \mathbb{R} \mid x \neq 0\}$



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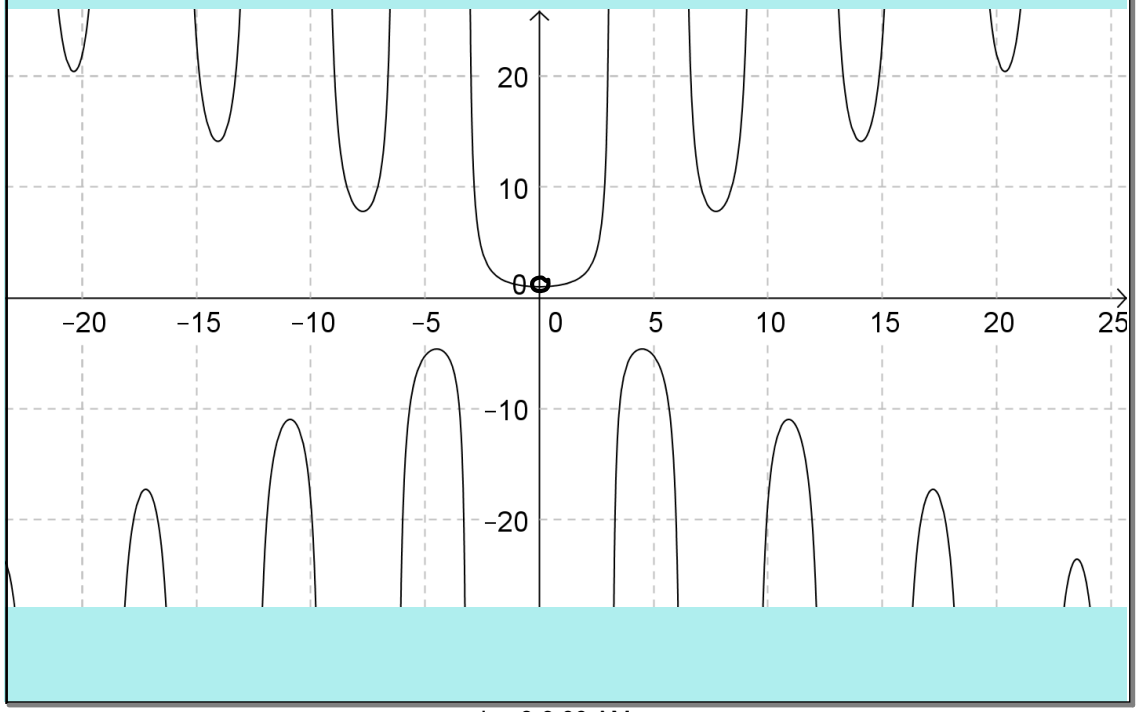
Example: $\dfrac{x}{\sin x}$ $D = \{x \in \mathbb{R} \mid x \neq n\pi, n \in \mathbb{Z}\}$



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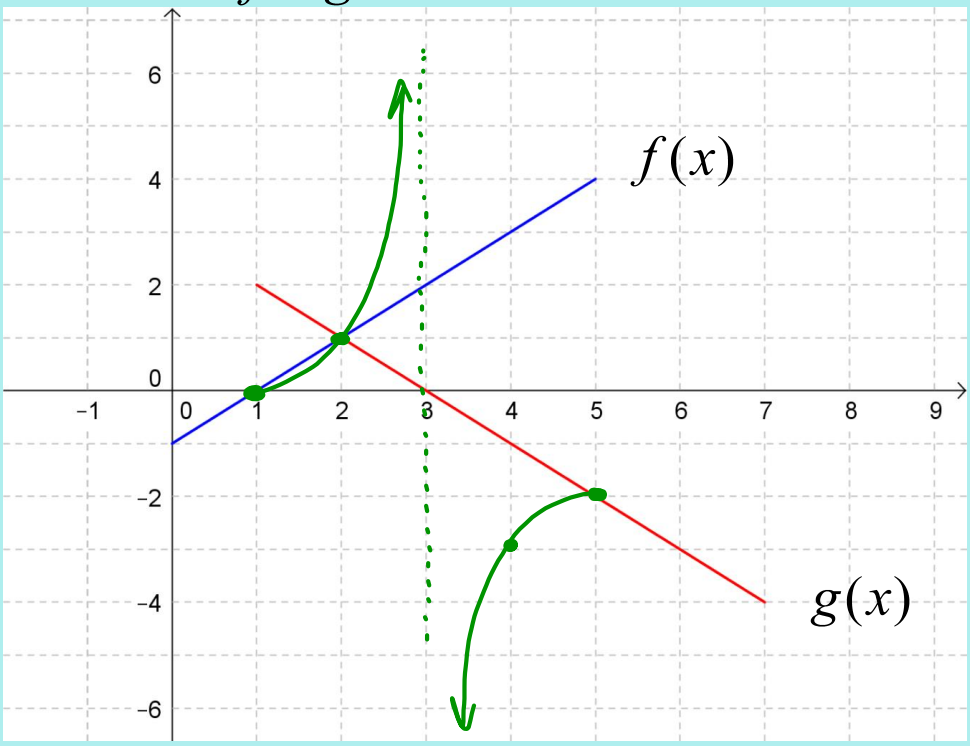
Ex.3 Graph $f \div g$



Jan 6-2:10 PM

Assigned Work:

p.542 # 1, 2, 3
p.544 # 3, 4, 6

e

4 (e) $P(t) = (t-8)(\quad) + 8(\quad)$

OT hours 8 reg hours

(assumes $t > 8$ hours)

Jan 6-9:35 AM

6. $C(h) = -30\cos\left(\frac{\pi}{6}h\right) + 34$

$D(h) = -3\sin\left(\frac{\pi}{6}h\right) + 7$

(a) $R(h) = [C(h)][D(h)]$

(b) ToV or tech.

Jan 9-9:22 AM