Dividing Polynomials by Monomials

The term **quotient** refers to the answer when dividing two expressions.

Example: Determine each quotient.

a) $\frac{9x+12}{3}$

$= \frac{9x}{3} + \frac{12}{3}$

$= 3x + 4$

b) $\frac{2x^2-4x}{-2x}$

$= \frac{2x^2}{-2x} - \frac{4x}{-2x}$

$= -x - -2$

$= -x + 2$

c) $\frac{12y^2+28y}{4y}$

$= \frac{12y^2}{4y} + \frac{28y}{4y}$

$= 3y + 7$

d) $\frac{12k^2+8k-5}{4}$

$= \frac{12k^2}{4} + \frac{8k}{4} - \frac{5}{4}$

$= 3k^2 + 2k - \frac{5}{4}$

Try these questions yourself. Determine each quotient.

a) $\frac{15x-10}{5}$

$= 3x - 2$

b) $\frac{14m^2+8m}{-2m}$

$= -7m - 4$

c) $\frac{6k^2+12k+8}{3}$

$= 2k^2 + 4k + \frac{8}{3}$

d) $\frac{2.8y^2+1.2y-1.6}{4}$

$= \frac{2.8y^2}{4} + \frac{1.2y}{4} - \frac{1.6}{4}$

$= 0.7y^2 + 0.3y - 0.4$

A business sells an advertising banner where the area of the banner is $3x^2 + 6x$ and the length is $3x$.

a) What algebraic expression represents the height of the banner?

$\text{height} = \frac{\text{area}}{\text{length}} = \frac{3x^2+6x}{3x}$

$= \frac{3x^2}{3x} + \frac{6x}{3x}$

$= x + 2$

The height of the banner is $x + 2$.

b) Calculate the area and height of a banner when the length is 120 cm.

$\text{length} = \frac{3x}{3} = \frac{120}{3}$

$x = 40\text{ cm}$

$\text{height} = x + 2 = 42\text{ cm}$

$\text{area} = \text{length} \times \text{height}$

$= 120 \times 42$

$= 5040\text{ cm}^2$

The height is 42 cm and the area is 5040 cm^2.

What is the ratio of the surface area to the radius of the cylinder? Write the ratio in simplest form.

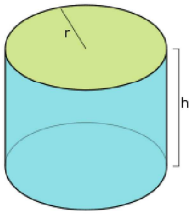
$\text{surface area} = 2\text{ circles} + \text{rectangle}$

$= 2\pi r^2 + 2\pi rh$

$\text{ratio}: \frac{2\pi r^2 + 2\pi rh}{r}$

$= \frac{2\pi r^2}{r} + \frac{2\pi rh}{r}$

$= 2\pi r + 2\pi h$



Assignment: p.276 #8, 11 – 13

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