



Calculus, Limits, Indeterminate

Name _____

Date _____

Find the following indeterminate limits

$$(1) \lim_{w \rightarrow 5} \frac{-3w^4 + 35w^3 - 122w^2 + 95w + 75}{-2w^4 + 23w^3 - 83w^2 + 105w - 75}$$

$$(2) \lim_{a \rightarrow -4} \frac{2a^3 + 5a^2 - 17a - 20}{-3a^2 - 15a - 12}$$

$$(3) \lim_{m \rightarrow -4} \frac{\sqrt{m^3 + 6m^2 + 5m + 37} - 7}{2 - \sqrt{-5m^3 - 18m^2 + 4m - 12}}$$

$$(4) \lim_{w \rightarrow -5} \frac{2w^3 + 21w^2 + 60w + 25}{-w^3 - 5w^2 + 25w + 125}$$

$$(5) \lim_{v \rightarrow 0} \frac{\sqrt{5v^3 + 4v^2 + 2v + 9} - 3}{6 - \sqrt{-5v^3 - 4v^2 - 2v + 36}}$$

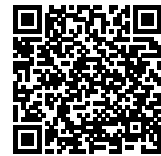
$$(6) \lim_{q \rightarrow 5} \frac{\sqrt{4q^2 - 20q + 1} - 1}{1 - \sqrt{-3q^2 + 16q - 4}}$$

$$(7) \lim_{u \rightarrow -5} \frac{-4u^2 - 18u + 10}{-2u^4 - 14u^3 - 24u^2 - 23u - 15}$$

$$(8) \lim_{b \rightarrow -4} \frac{\sqrt{-5b^2 - 19b + 85} - 9}{7 - \sqrt{-4b^2 - 19b + 37}}$$

$$(9) \lim_{q \rightarrow 4} \frac{4q^5 - 21q^4 + 16q^3 + 15q^2 + 16}{3q^2 - 14q + 8}$$

$$(10) \lim_{h \rightarrow 5} \frac{\sqrt{4h^2 - 20h + 81} - 9}{8 - \sqrt{-5h^3 + 21h^2 + 17h + 79}}$$



Answers

Find the following indeterminate limits

$$(1) \lim_{w \rightarrow 5} \frac{-3w^4 + 35w^3 - 122w^2 + 95w + 75}{-2w^4 + 23w^3 - 83w^2 + 105w - 75}$$

$$= \frac{47}{38}$$

$$(2) \lim_{a \rightarrow -4} \frac{2a^3 + 5a^2 - 17a - 20}{-3a^2 - 15a - 12}$$

$$= \frac{13}{3}$$

$$(3) \lim_{m \rightarrow -4} \frac{\sqrt{m^3 + 6m^2 + 5m + 37} - 7}{2 - \sqrt{-5m^3 - 18m^2 + 4m - 12}}$$

$$= \frac{5}{322}$$

$$(4) \lim_{w \rightarrow -5} \frac{2w^3 + 21w^2 + 60w + 25}{-w^3 - 5w^2 + 25w + 125}$$

$$= -\frac{9}{10}$$

$$(5) \lim_{v \rightarrow 0} \frac{\sqrt{5v^3 + 4v^2 + 2v + 9} - 3}{6 - \sqrt{-5v^3 - 4v^2 - 2v + 36}}$$

$$= 2$$

$$(6) \lim_{q \rightarrow 5} \frac{\sqrt{4q^2 - 20q + 1} - 1}{1 - \sqrt{-3q^2 + 16q - 4}}$$

$$= \frac{10}{7}$$

$$(7) \lim_{u \rightarrow -5} \frac{-4u^2 - 18u + 10}{-2u^4 - 14u^3 - 24u^2 - 23u - 15}$$

$$= \frac{22}{167}$$

$$(8) \lim_{b \rightarrow -4} \frac{\sqrt{-5b^2 - 19b + 85} - 9}{7 - \sqrt{-4b^2 - 19b + 37}}$$

$$= -\frac{49}{39}$$

$$(9) \lim_{q \rightarrow 4} \frac{4q^5 - 21q^4 + 16q^3 + 15q^2 + 16}{3q^2 - 14q + 8}$$

$$= \frac{316}{5}$$

$$(10) \lim_{h \rightarrow 5} \frac{\sqrt{4h^2 - 20h + 81} - 9}{8 - \sqrt{-5h^3 + 21h^2 + 17h + 79}}$$

$$= \frac{40}{333}$$