

**Exercise 1** Let  $g(x) = x - 5$ , and  $h(x) = x - 4$ .

Choose the correct statement regarding the form of the limit and evaluate the limit. Possible answers include a number,  $+\infty$ ,  $-\infty$  and *DNE*.

$$\lim_{x \rightarrow 4} \frac{h(x)}{g(x)} = \boxed{0}$$

Choose all correct statements.

**Select All Correct Answers:**

- (a) The limit is of determinate form. ✓
  - (b) The limit is of indeterminate form.
  - (c) The limit is of the form  $\frac{0}{0}$ .
  - (d) The limit is of the form  $\frac{\#}{0}$ .
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$$\lim_{x \rightarrow 4^+} \frac{g(x)}{h(x)} = \boxed{-\infty}$$

Choose all correct statements.

**Select All Correct Answers:**

- (a) The limit is of determinate form. ✓
  - (b) The limit is of indeterminate form.
  - (c) The limit is of the form  $\frac{0}{0}$ .
  - (d) The limit is of the form  $\frac{\#}{0}$ . ✓
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$$\lim_{x \rightarrow 4^-} \frac{g(x)}{h(x)} = \boxed{+\infty}$$

Choose all correct statements.

**Select All Correct Answers:**

- (a) The limit is of determinate form. ✓
- (b) The limit is of indeterminate form.
- (c) The limit is of the form  $\frac{0}{0}$ .
- (d) The limit is of the form  $\frac{\#}{0}$ . ✓

$$\lim_{x \rightarrow 4} \frac{g(x)}{h(x)} = \boxed{DNE}$$

Choose all correct statements.

**Select All Correct Answers:**

- (a) The limit is of determinate form. ✓
- (b) The limit is of indeterminate form.
- (c) The limit is of the form  $\frac{0}{0}$ .
- (d) The limit is of the form  $\frac{\#}{0}$ . ✓

**Exercise 1.1** Let  $g(x) = \frac{2}{x+3} - \frac{1}{x+2}$ , and  $h(x) = x - 4$ .

- (a) Evaluate the limit.

$$\lim_{x \rightarrow 4} g(x) = \lim_{x \rightarrow 4} \frac{\boxed{x+1}}{(x+2)(x+3)} = \boxed{\frac{5}{42}}$$

- (b) Choose all correct statements regarding the form of the limit.

$$\lim_{x \rightarrow 4} \frac{\frac{2}{x+3} - \frac{1}{x+2}}{x-4}$$

Choose all correct statements.

**Select All Correct Answers:**

- (i) The limit is of determinate form. ✓
- (ii) The limit is of indeterminate form.

- (iii) The limit is of the form  $\frac{0}{0}$ .
- (iv) The limit is of the form  $\frac{\#}{0}$ . ✓
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**Exercise 1.1.1** Evaluate the limit. Possible answers include a number,  $+\infty$ ,  $-\infty$  and DNE.

$$\lim_{x \rightarrow 4+} \frac{\frac{2}{x+3} - \frac{1}{x+2}}{x-4} = \boxed{+\infty}$$

Justify your answer by choosing the correct statement.

**Select All Correct Answers:**

- (a) The numerator is negative and the denominator is positive and approaching zero.
- (b) The numerator is positive and the denominator is positive and approaching zero. ✓
- (c) The numerator is positive and the denominator is negative and approaching zero.
- (d) The numerator is negative and the denominator is negative and approaching zero.
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**Exercise 1.1.1.1** Evaluate the limit. Possible answers include a number,  $+\infty$ ,  $-\infty$  and DNE.

$$\lim_{x \rightarrow 4-} \frac{\frac{2}{x+3} - \frac{1}{x+2}}{x-4} = \boxed{-\infty}$$

Justify your answer by choosing the correct statement.

**Select All Correct Answers:**

- (a) The numerator is negative and the denominator is positive and approaching zero.
- (b) The numerator is positive and the denominator is positive and approaching zero.
- (c) The numerator is positive and the denominator is negative and approaching zero. ✓

- (d) The numerator is negative and the denominator is negative and approaching zero.
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**Exercise 1.1.1.1.1** Evaluate the limit. Possible answers include a number,  $+\infty$ ,  $-\infty$  and *DNE*.

$$\lim_{x \rightarrow 4} \frac{\frac{2}{x+3} - \frac{1}{x+2}}{x-4} = \boxed{DNE}$$

Justify your answer by choosing the correct statement.

**Select All Correct Answers:**

- (a) The limit from the left is not equal to the limit from the right. ✓  
(b) The limit from the left is equal to the limit from the right.
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