

## Calculus readiness test

**Factor completely the following expressions.**

1)  $x^2 - 36$

2)  $3x^2 - 18$

3)  $x^2 - x - 12$

4)  $6x^2 - 13x + 6$

5)  $2a^2 + 10a + 12$

**Simplify the following expressions:**

6)  $\frac{x+1}{x-1} + \frac{x+2}{x-2} + \frac{2x}{x^2-3x+2}$

7)  $\frac{\frac{1}{x} - \frac{2}{x^2} - \frac{3}{x^3}}{\frac{1}{x} + \frac{1}{x^2} - \frac{12}{x^3}}$

**Evaluate the following expressions:**

8)  $\cos \frac{\pi}{4}$

9)  $\sec \frac{2\pi}{3}$

10)  $3 \sin \frac{5\pi}{6}$

**Find each of the following:**

11)  $\cos(x-y)$

12)  $\sin(x+y)$

13)  $1 - \sin^2 6$

14)  $\tan^2 \theta + 1$

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15)  $\sin^2\theta - \cos^2\theta$

16)  $x^3 - y^3 =$

17)  $(x+y)^2 =$

18)  $(x+y)^3 =$

19)  $(x+y)^5 =$  (use binomial expansion for this one)

20)  $\sqrt{24x^5y^6z^7}$

21)  $\sqrt[3]{54x^{10}y^5}$

*Rewrite the following radical using rational exponents.*

21)  $\sqrt[5]{3x^2y^6}$

22)  $\sqrt[3]{8x^9y^{11}}$

*Rewrite the following using radicals.*

23)  $5^{\frac{1}{3}}x^{\frac{1}{3}}y^{\frac{4}{3}}$

24)  $2^{\frac{1}{3}}x^{\frac{3}{4}}$

*Find each of the following:*

25)  $\log_2 4$

26)  $\log_6 9 + \log_6 4$

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27)  $3 \log_8 2$

28) Find the equation of the line that passes through the point (1, 2) and is parallel to the line  $y = 3x - 5$ .

29) Find the equation of the line that passes through the point (2, 5) and is perpendicular to the line  $y = -\frac{1}{5}x + 4$ .

*Solve the following equations.*

30)  $2^{x+1} = 8^{x-2}$

31)  $2^{x+1} = 36$

Solve the following equation by completing the square.

32)  $x^2 - 3x + 1 = 0$