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|  | V Satz des Pythagoras und Körper, Check-out |  |  |  |  |
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Check-out Kapitel V

Schätze dich mithilfe der Checkliste ein.

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|  | Checkliste |  |  |  | Lerntipps | zum Nacharbeiten |
| 1. | Ich kann rechtwinklige Dreiecke in Figuren und Körpern erkennen und mithilfe des Satzes des Pythagoras fehlende Seitenlängen bestimmen. | 🞎 | 🞎 | 🞎 | Lehrtext, Merkkasten und Beispiel auf Seite 177 | Seite 178: A4  Seite 180: A11  Seite 194: A1 |
| 2. | Ich kann den Mantelflächeninhalt M, das Volumen V und den Oberflächen­inhalt O einer Pyramide berechnen. | 🞎 | 🞎 | 🞎 | Lehrtext und Merkkasten auf Seite 181  Beispiel auf Seite 182 | Seite 183: A6  Seite 184: A9 |
| 3 | Ich kann den Mantelflächeninhalt M, das Volumen V und den Oberflächen­inhalt O eines Kegels berechnen. | 🞎 | 🞎 | 🞎 | Lehrtext auf Seite 186 und 187  Merkkasten und Beispiel auf Seite 186 | Seite 187: A5  Seite 188: A11  Seite 194: A4 |
| 4. | Ich kann fehlende Maße einer Kugel berechnen. | 🞎 | 🞎 | 🞎 | Lehrtext und Merkkasten auf Seite 190  Beispiel auf Seite 191 | Seite 192: A5  Seite 193: A13  Seite 195: A5, A6 |

Überprüfe deine Einschätzung.



Zu 1. **Rechtwinklige Dreiecke in Figuren und Körpern erkennen und Seitenlängen berechnen**

1 Berechne die Länge x im rechtwinkligen Dreieck bzw. im Rechteck ABCD mit dem Satz des Pythagoras.

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| a) | SE96733892_G_K05_kv063_01.png |  | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | |  | b) | SE96733392_G_K04_02.png |  | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | |

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| c) Ein regelmäßiges Sechseck setzt sich aus sechs gleichseitigen Dreiecken zusammen. Bestimme den Abstand d, den die gegen­überliegenden Seiten voneinander haben, in Abhängigkeit von a. Berechne dann d für . | S750733494_G_K03_004a.png |

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|  | V Satz des Pythagoras und Körper, Check-out |  |  |  |  |
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d) Eine Schultüte hat die Form einer geraden Pyramide mit regelmäßiger, sechseckiger Grundfläche. Die Seiten­länge des Sechsecks beträgt 10 cm und die Seitenkante s der Pyramide 51 cm. Zeichne in der Schultüte ein geeignetes rechtwinkliges Dreieck ein und trage die gegebenen Größen ein. Berechne die Höhe der Schultüte

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Zu 2. **Volumen und Oberflächeninhalt von Pyramiden berechnen**

a) Zeige rechnerisch, dass in der abgebildeten Pyramide Folgendes gilt:   
 und .

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b) Berechne den Mantelflächeninhalt M, den Oberflächeninhalt O und das Volumen V der Pyramide.

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|  | V Satz des Pythagoras und Körper, Check-out |  |  |  |  |
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Zu 3. **Volumen und Oberflächeninhalt von Kegeln berechnen**

a) Eine weitere Schultüte hat die Form eines Kegels. Berechne, aus wie viel dm2 Pappe die Schultüte besteht, wenn diese 50 cm hoch ist und einen Radius von 9 cm hat, und für die Klebekanten 5 % Material­zuschlag eingerechnet werden müssen.

b) Vergleiche das Volumen der pyramidenförmigen Schultüte aus Aufgabe 4 d) mit der kegel­förmigen Schultüte aus Teilaufgabe a).

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Zu 4. **Volumen, Oberflächeninhalt, Inhalt der Querschnittsfläche und Umfang einer Kugel berechnen**

Berechne für eine Kugel mit einem Umfang von 10 cm den Radius r, das Volumen V, den Oberflächeninhalt O und den Flächeninhalt der Querschnittsfläche A.

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|  | V Satz des Pythagoras und Körper, Check-out |  |  | Lösungen |  |
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Check-out Kapitel V, S 105 – S 107

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| 1 a)  b) Berechnung der Rechteckdiagonalen:  Berechnung der fehlenden Seite z des kleinen Dreiecks: |  | SE96733392_G_K04_02_Loes.png |
| c) Das Dreieck ABM ist rechtwinklig mit den Katheten und und der Hypotenuse a (vgl. Abb.).  Mithilfe des Satzes des Pythagoras erhält man | S750733494_G_K03_004_Loe.png | |
| d) Das eingezeichnete Dreieck ist rechtwinklig mit den Katheten a und h und der Hypotenuse s (vgl. Abb.).  Mithilfe des Satzes des Pythagoras erhält man die Höhe h.        Die Schultüte hat eine Höhe von etwa 50 cm. |  | S750733494_G_K03_004b_Loe.png |

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| **2** a)  b) |  | SE96733392_G_K06_06_Loes.png SE96733392_G_K06_06_Loes_a.png |

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|  | V Satz des Pythagoras und Körper, Check-out |  |  | Lösungen |  |
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| 3 a)  Die Mantellinie s des Kegels lässt sich mit dem  Satz des Pythagoras berechnen:            Inklusive Klebekanten:    Die Schultüte besteht aus etwa 15 dm2 Pappe. |  | |  |  | | --- | --- | | b) |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  |   Das Volumen der pyramidenförmigen Schultüte ist etwas größer als das Volumen der kegelförmigen Schultüte. |

4 Mit erhält man den Radius der Kugel:

Damit folgt:

Volumen:

Inhalt der Querschnittsfläche:

Oberflächeninhalt: